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ABSTRACT

This curriculum guide on the subject of nutrition is designed to aid health education teachers of students from grade seven through grade twelve. It is divided into three parts. Part one presents background information for teachers who have had no formal training in nutrition, and also serves as a review for school nurses and health educators. In addition to presenting basic knowledge for planning meaningful learning experiences, it discusses contemporary issues that are of great concern to the nutritional health of world populations. Part two is a guide for a sequential nutrition education program as an integral element in all disciplines of the curriculum for the secondary grades. In part three resource materials and teaching aids are presented. These include an annotated bibliography of books, audiovisual aids, and suggested readings from current magazines. (JD)

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FOCUS ON NUTRITION

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A TEACHER'S HANDBOOK FOR NUTRITION EDUCATION GRADES SEVEN THROUGH TWELVE

Massachusetts Department of Education

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If you give a man a fish, he will have a meal.
If you teach him to fish, he will have a living.

If you are thinking a year ahead, sow seed.
If you are thinking ten years ahead, plant a tree.
If you are thinking one hundred years ahead, educate the people.

By sowing seed once, you will harvest once.
By planting a tree, you will harvest tenfold.
By educating the people, you will harvest one hundred-fold.

Kuan-tzu, fourth to third century B.C., China

FOCUS ON NUTRITION

A Teacher's Handbook for Nutrition Education
Grades Seven Through Twelve

The Commonwealth of Massachusetts
Department of Education
Gregory R. Anrig, Commissioner

Prepared By
The Bureau of Nutrition Education and School Food Services
John C. Stalker, Director
1973

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Foreword

In 1971, the State Department of Education published ten educational goals for Massachusetts. These goals are essential to setting directions and indispensable for measuring progress. We may never reach these ideals of excellence, but as the early Roman philosopher, Seneca, has said, "*If we do not know to which port we are sailing, no wind is favorable.*"

The ten goals are intertwined; no one goal stands alone. However, the first listed goal is *physical and emotional well-being* — for without these basic attributes of good physical and mental health, advancement toward other goals will be more difficult.

The learner, whether he be a child or an adult, must be aware of the relationship between nutrition and health — that without good nutrition you cannot have good health. The learner must also recognize that nutritional well-being is essential throughout life, not only for his own health but also for the health of future generations.

Recent studies have demonstrated the need for schools to provide nutrition education as a part of the curriculum of all children from grades kindergarten through twelve. It must be a cooperative effort of schools, home, and community. Schools must also provide adequate feeding programs that promote and support nutritional well-being.

It is for these reasons that the State Department of Education published in 1970 a teacher's handbook for nutrition education in grades kindergarten through six, and has completed the cycle with this handbook for grades seven through twelve. These guides provide comprehensive and sequential nutrition education as an integral part of the curriculum for each child throughout his school years. They establish the school food service program as the accepted laboratory for providing learning experiences that implement and reinforce classroom teaching.

As Commissioner of Education for the Commonwealth of Massachusetts, I recommend and urge that all school administrators and teachers make a concerted effort to improve the food habits of our youth as a prime health objective. In this way, we can help assure that the future leaders of our country will be physically and emotionally fit.

Gregory R. Anrig
Commissioner of Education

PART ONE
BACKGROUND INFORMATION

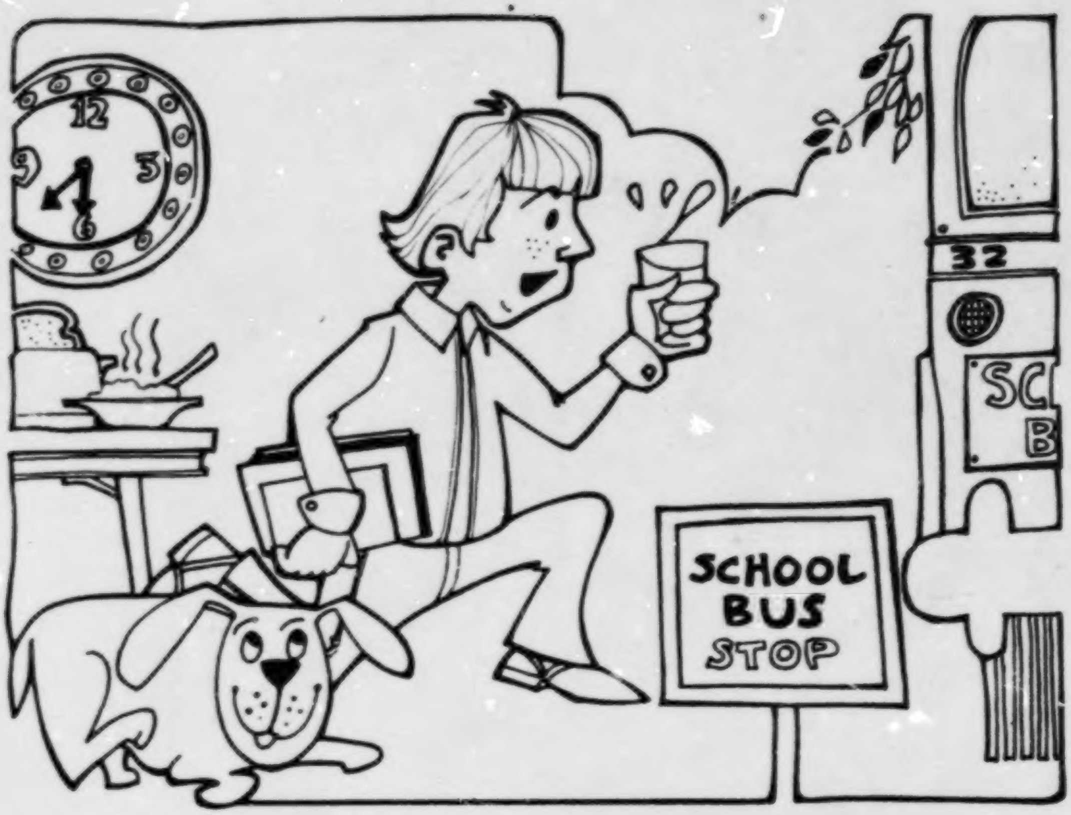
Part One presents background information for teachers who have had no formal training in nutrition, and also serves as a review for school nurses or health educators. In addition to presenting basic knowledge for planning meaningful learning experiences, it discusses contemporary issues which are of great concern to the nutritional health of world populations.

Among the various age groups surveyed, adolescents between the ages of 10 and 16 years had the highest prevalence of unsatisfactory nutritional status. Male adolescents had more evidence of malnutrition than females.

1968-1970 Ten-State Nutrition Survey
Dr. Arnold Schaefer, National Director

1

NEED



As a secondary school principal, would you be shocked to know that more than 50 percent of your students arrived this morning inadequately fed? In addition, approximately one-half of them will eat an inadequate lunch.

As a high school teacher, would you be surprised to learn that nearly two-thirds of the girls in your class had a submarginal morning meal, and more than 50 percent of them will have a poor lunch? In fact, 15 percent of the girls will go without a noon meal. Even your boys are not setting any records. More than 50 percent of them had an inadequate breakfast, one-third will eat a less than satisfactory lunch, and 9 percent will go without lunch.

These are some of the facts from a 1969 surprise dietary survey made by the Massachusetts Department of Education. Almost 80,000 public school children participated. Your school may have been one of the 231 schools that returned the computer forms. Because of the numbers surveyed, and the selection methods, results can be projected to all Massachusetts schools.

Perhaps you are already aware of these dietary shortcomings of our youth. A high school principal speaking at a National Nutrition Education Conference in Washington said, "*Those of us at the secondary level witness the poor eating habits of the teen-age student, review the report of the health nurse on students who report with headaches and stomach-aches either because of little or no breakfast or crash dieting, and notice the obesity prevalent among the teen-ager.*"

WHY

Why is the dietary image of our adolescents so negative? The experts suggest a number of reasons. The teen-ager is striving for independence. He tends to reject the customary eating patterns, and as a result, mother loses control over the food he consumes. (The Massachusetts dietary survey evidenced progressively deteriorating food habits through the elementary, junior high, and senior high school levels.)

The teen-ager wants peer recognition and approval. This is also reflected in his eating habits. (A frequent comment on our survey form was, *"I don't buy lunch in school because my friends don't."*) A high school student speaking before a group of nutrition educators remarked, *"There are great peer pressures to eat. If one person at the lunch table is eating ice cream, almost everyone eats ice cream."*

The adolescent tends to skip meals and eat many snacks. One national health magazine estimates that teen-agers get at least one-fourth of their daily food in snacks. Open Campus (MAX-ED) programs note that the cafeteria is a favorite gathering place. One finding of the 1971 Iowa report of *Student Use of Unscheduled Time* was that large numbers of students were in the cafeterias each module. Snacking, in itself, is not detrimental as long as it does not squeeze out essential nutrients or the student has no weight problem. However, the Massachusetts survey demonstrated that almost 80 percent of the students selecting lunch from a la carte items ate an inadequate noon meal.

The teen years represent a period of rapid growth and body changes. It is second only to the prenatal and infancy period in rate. The young adult is concerned with his physical appearance. Girls, particularly, are weight conscious (and unfortunately, fashion dictates the too-slender figure). Girls are prone to fad diets, skipping meals, and eliminating highly nutritious and needed foods such as milk. Oddly enough, studies have shown that girls snack more often than boys, and often select items that add more calories than the meals they omit.

The teen-age way of life also makes its impact on eating habits. It is a period of many activities — sports, clubs, volunteer work, after-school jobs. Some teen-agers (and adults, too) rarely eat "meals." As long ago as 1961, studies found it to be true of one-third of this age group.

Finally, there is the major change in our food supply and a prevalence of misinformation about food and nutrition. In 1940, approximately 1,000 food items were available on market shelves; today, the average supermarket offers 8,000 plus items for sale. In addition, laboratory-made nutrients are being sold across the counter or added to foods. With the variety of foods and "health" items competing for sale, it becomes difficult for the teen-ager to select a well-balanced diet.

WHAT MUST BE DONE

There can be no question that the food habits of teen-agers need improvement. The decisions to be made are *what must be done, who must do it,* and *how.*

A sound nutrition education program is one factor in improving eating practices, and the school should play a key role. The Final Report of the 1969 White House Conference on Food, Nutrition and Health states:

> *"Throughout his life every person should be able to make decisions on his choices of food based on an understanding of his needs as determined by: (1) his physiological state and physical activities, (2) his knowledge of the nutrient composition of plant, animal, and formulated foods in his environment, (3) his ability to distinguish between truth and distortion in relation to foods, nutrition, and health, (4) his personal likes and cultural background, and (5) his ability to use his available resources whatever they may be."*

The student must recognize his special needs for specific nutrients. Girls have the responsibility for the health of future generations as well as their own health. Girls who are underweight or poorly nourished during teen years have a higher incidence of disorders during pregnancy and are more apt to have premature births. Since about one out of every four babies is born to a woman of twenty years old or less, it is imperative that good nutrition habits be a part of each teen-age girl's regimen.

The student must know the kinds of food, and the amounts necessary, to reach his daily requirements — and have the wisdom to eat these foods. As stated earlier, between-meal snacking, or more than three meals a day, is not harmful as long as the foods chosen are not "empty calories" that replace needed nutrients or augment obesity. Studies have shown, though, that when less than three meals a day are included, it is difficult to reach nutritive requirements. With the vast assortment of foods available and the impact of advertising, plus the propaganda of food fads, it is also important that each student have a sound nutritional knowledge as a basis for making the right selection.

The *economic resources* and the *opportunity to obtain the necessary food* are other vital factors in improving eating practices. Adequate school food service programs — lunch, and breakfast where needed — must be available for all students. The charge for these meals must be kept within the economic reach of most students, and given free or at a reduced price for those who cannot afford to pay. It is not sensible to expend millions of dollars for educational purposes if our classrooms are filled with listless, inattentive, and even disruptive students who are hungry because of the lack of food during the past twelve to fifteen hours, or who are malnourished from the lack of sufficient food.

WHO IS RESPONSIBLE

Clearly, the responsibility for improving nutritional health through education and adequate food services must be a cooperative effort. The home and school share it with the community.

During the early years, nutrition education takes place mainly in the home. However, with the institution of the extended school day, extended school year, Open Campus (MAX-ED) programs, and other innovative curricula, the school and community have to assume greater responsibility.

CONTRIBUTION OF THE HOME

- Serve nutritionally sound meals that include a wide variety of foods. Adapt mealtimes to the active teen-age schedule and give special attention to nutritious between-meal snacks.
- Set a good example for their teen-agers by showing that all family members need good food, but in different amounts.
- Cooperate with the family physician or school doctor and nurse in the detection and follow-up of nutritional difficulties and in the convalescence from illness.
- Promote and support an optimum school food service program that upholds the nutritional teachings of the educational program for every teen-ager.
- Cooperate with the school in such activities as food habit surveys, exhibits, field trips, and projects concerned with nutrition.

CONTRIBUTION OF THE SCHOOL

- Incorporate and correlate nutrition education in all disciplines of the curriculum that can contribute, including classrooms, cafeteria, physical and health services, off-campus programs, and extracurricular activities for teen-agers and parents.
- Provide and support school food service as mandated in Massachusetts legislation.
- Know the home conditions, economic and ethnic, so the staff may appreciate how the students live and what factors may affect the application of nutrition knowledge, eating habits, and attitudes.
- Solicit and support parental involvement in the nutrition activities of the schools.
- Provide in-service training in nutrition for teachers, nurses, health educators, food service personnel, and other pertinent school staff members, using available nutrition consultation resources.

CONTRIBUTION OF THE COMMUNITY

- Provide money and facilities for adequate:
  1. School health services and follow-up.
  2. School food services for all students — lunch, and breakfast where needed — with attention to special diet as indicated.
- Cooperate as citizens in Open Campus (MAX-ED) implementation and other school projects that relate to nutritional well-being.
- Participate in community-wide projects such as institutes, meetings, radio and television programs, exhibits, and physical fitness activities.

Leadership in nutrition education may well be the prerogative of the school since it has a closely-knit staff of recognized standing in education, with facilities for food services and for cooperative guidance from health personnel.

Recommended Dietary Allowances*, revised 1973. Food and Nutrition Board, National Academy of Sciences-National Research Council—designed for the maintenance of good nutrition of practically all healthy people in the U.S.A.

	age	weight		height		energy	protein	fat-soluble vitamins				water-soluble vitamins							minerals					
	from up to							vitamin A activity		vitamin D	vitamin E activity¶	ascorbic acid	folacin‖	niacin**	riboflavin	thiamin	vitamin B_6	vitamin B_{12}	calcium	phosphorus	iodine	iron	magnesium	zinc
	yr.	kg.	lb.	cm.	in.	kcal.†	gm.	RE‡	← I.U.		→	mg.	mcg.	← mg.			→	mcg.	mg.	mg.	mcg.	← mg.		→
infants	0.0—0.5	6	14	60	24	kg. × 117	kg. × 2.2	420#	1,400	400	4	35	50	5	0.4	0.3	0.3	0.3	360	240	35	10	60	3
	0.5—1.0	9	20	71	28	kg. × 108	kg. × 2.0	400	2,000	400	5	35	50	8	0.6	0.5	0.4	0.3	540	400	45	15	70	5
children	1—3	13	28	86	34	1,300	23	400	2,000	400	7	40	100	9	0.8	0.7	0.6	1.0	800	800	60	15	150	10
	4—6	20	44	110	44	1,800	30	500	2,500	400	9	40	200	12	1.1	0.9	0.9	1.5	800	800	80	10	200	10
	7—10	30	66	135	54	2,400	36	700	3,300	400	10	40	300	16	1.2	1.2	1.2	2.0	800	800	110	10	250	10
males	11—14	44	97	158	62	2,800	44	1,000	5,000	400	12	45	400	18	1.5	1.4	1.6	3.0	1,200	1,200	130	18	350	15
	15—18	61	134	172	69	3,000	54	1,000	5,000	400	15	45	400	20	1.8	1.5	1.8	3.0	1,200	1,200	150	18	400	15
	19—22	67	147	172	69	3,000	54	1,000	5,000	400	15	45	400	20	1.8	1.5	2.0	3.0	800	800	140	10	350	15
	23—50	70	154	172	69	2,700	56	1,000	5,000		15	45	400	18	1.6	1.4	2.0	3.0	800	800	130	10	350	15
	51+	70	154	172	69	2,400	56	1,000	5,000		15	45	400	16	1.5	1.2	2.0	3.0	800	800	110	10	350	15
females	11—14	44	97	155	62	2,400	44	800	4,000	400	10	45	400	16	1.3	1.2	1.6	3.0	1,200	1,200	115	18	300	15
	15—18	54	119	162	65	2,100	48	800	4,000	400	11	45	400	14	1.4	1.1	2.0	3.0	1,200	1,200	115	18	300	15
	19—22	58	128	162	65	2,100	46	800	4,000	400	12	45	400	14	1.4	1.1	2.0	3.0	800	800	100	18	300	15
	23—50	58	128	162	65	2,000	46	800	4,000		12	45	400	13	1.2	1.0	2.0	3.0	800	800	100	18	300	15
	51+	58	128	162	65	1,800	46	800	4,000		12	45	400	12	1.1	1.0	2.0	3.0	800	800	80	10	300	15
pregnant						+300	+30	1,000	5,000	400	15	60	800	+2	+0.3	+0.3	2.5	4.0	1,200	1,200	125	18+††	450	20
lactating						+500	+20	1,200	6,000	400	15	60	600	+4	+0.5	+0.3	2.5	4.0	1,200	1,200	150	18	450	25

*The allowances are intended to provide for individual variations among most normal persons as they live in the U.S. under usual environmental stresses. Diets should be based on a variety of common foods in order to provide other nutrients for which human requirements have been less well defined. See text for more detailed discussion of allowances and of nutrients not tabulated.

†Kilojoules (KJ) = 4.2 × kcal.

‡Retinol equivalents.

#Assumed to be all as retinol in milk during the first six months of life. All subsequent intakes are assumed to be one-half as retinol and one-half as beta-carotene when calculated from International Units. As retinol equivalents, three-fourths as retinol and one-fourth as beta-carotene.

¶Total vitamin E activity, estimated to be 80 per cent as alpha-tocopherol and 20 per cent other tocopherols. See text for variation in allowances.

‖The folacin allowances refer to dietary sources as determined by *Lactobacillus casei* assay. Pure forms of folacin may be effective in doses less than one-fourth of the recommended dietary allowance.

**Although allowances are expressed as niacin, it is recognized that on the average, 1 mg. niacin is derived from each 60 mg. dietary tryptophan.

††This increased requirement cannot be met by ordinary diets; therefore, the use of supplemental iron is recommended.

2

A WORKING KNOWLEDGE

NUTRIENTS
FATS & OILS
A
PROTEINS
VITAMINS
B
MILK

A working knowledge of nutrition helps the teacher to understand the "whys" and to interpret the needs of his classes. The formal education of many teen-agers will terminate with high school. Every student should be made aware of the importance of food and nutrition so that the first listed educational goal for Massachusetts, *physical and emotional well-being*, may be achieved.

NUTRIENTS

Over fifty nutrients are known to be needed by the body for good health — and more are being discovered. Each performs its own particular job and no other can take its place. Some carry on many functions. The lack of even one of these essential food elements will hinder the work of others. For example, the body uses iron only when protein is also available. The functions of the nutrients include:

- Providing the body with fuel, which when oxidized, releases energy for body activities.
- Providing materials for the building and maintenance of body tissues.
- Providing materials for regulating body processes.

The essential nutrients fit into five common groups: *proteins, carbohydrates, fats, minerals, and vitamins*. Many people also classify *water* as a nutrient.

Deciding just how much of the nutrients is necessary is a job for experts. The amount varies with age, sex, build, activity, and climate.

In 1943, the country's professional leaders in nutrition were formed into a National Research Council under the National Academy of Sciences. They published the first *Recommended Dietary Allowances* based on nutrition knowledge of the day. Since that time, there have been periodic revisions to bring the recommendations up to date. (See table, page 6.) Except for calories, these goals are set well above the minimum amounts necessary to maintain good nutrition in healthy children, adolescents, and adults living in the United States.

PROTEINS

Protein is used to build and repair muscles, glands, bones, and other tissues. It forms part of all body fluids: blood, lymph, enzymes, and hormones. For example, protein in the blood helps to maintain cellular fluid balance; as a part of hemoglobin, assists in transporting oxygen and carbon dioxide; and in the form of antibodies, fights disease. Protein plays an important part in the manufacture of DNA and RNA, the nucleic acids which are related to the inheritance factor. Protein is used for energy when the diet contains too little fat and carbohydrate.

Proteins are made up of twenty "building blocks" called amino acids. Amino acids are classified as *essential* or *nonessential*. Essential amino acids cannot be synthesized by the body in quantities sufficient to maintain life and support growth. They must be supplied by the diet. Nonessential amino acids can be synthesized by the body. However, the necessary material for the synthesis of the nonessential amino acids must be provided in the diet.

The quality of protein is also classified in terms of *biological value*. It relates to how well the protein is utilized by the body. Factors affecting biological value include amino acid content, digestibility and absorption, and method of preparation. Egg protein is considered to have the highest biological value, and is used as the standard to judge the biological value of other proteins.

Foods that contain all of the essential amino acids in sufficient amounts to maintain life and support growth are called *complete proteins*. These include milk, egg, cheese, meat, poultry, and fish. They are also referred to as having *high biological value*.

Foods that contain the amino acids in amounts to maintain life but not support growth are called *partially incomplete proteins*. They include cereal grains, legumes, nuts, and other vegetables. These proteins vary widely in their biological value. However, if they are eaten at the same time with an animal source of protein (such as milk, cheese, or meat), all of the essential components to maintain life and support growth will be available to the body.

Foods that do not contain amino acids in amounts sufficient to either maintain life or support growth are called *incomplete proteins*. Gelatin is an example of an incomplete protein.

PROTEIN REQUIREMENTS

Protein needs are greater during the teen years than in any other period of life (except pregnancy and lactation). This is due to the accelerated growth rate during adolescence. If insufficient protein is consumed, body protein will be broken down to supply the amino acids necessary for metabolism.

Protein deficiencies can cause stunted growth, mental retardation in the very young, lowered resistance to disease, and poor muscle development. Early symptoms include fatigue and lassitude. *Edema* (abnormal collection of body fluid) may also develop.

Severe protein deficiency may cause *kwashiorkor* in the very young. It is more common in developing nations. Kwashiorkor can result from a lack of high quality protein as well as from an insufficient quantity. It usually occurs in a child, who after weaning, subsists mainly on cereal proteins with little intake from animal sources. Severe protein deficiency in children, accompanied by insufficient caloric intake, can result in *marasmus*. This protein-calorie malnutrition, either alone or in combination with infectious disorders, constitutes one of the main causes of death and disease in the world population today.

PROTEIN SUPPLY

The United States has an abundant supply of high quality proteins. The per person/per day amount of animal protein available is more than eight times that of a person living in the Far East. It is not distributed equally. High income level families consume more meat, milk and milk products, fish, and poultry; low income families consume more grain products.

There is a deficiency of protein in the developing countries. The average consumption is less than two-thirds that of the developed nations. The main source of their protein is from the grains.

To close the protein gap and insure sufficient protein supplies for the increasing world population, new and improved sources of protein must be found.

- Scientists are developing grains with a higher biological protein content.
- Plant proteins are being mixed to improve their amino acid content.
- Fabricated meat products and protein extenders are being manufactured from soybeans.
- Fish protein concentrates are being prepared that are of high biological value but are tasteless and odorless.

These products can improve the biological value and decrease the cost of protein for human consumption. The problem rests in creating consumer acceptance.

CARBOHYDRATES (Sugars and Starches)

Carbohydrates furnish energy for physical activity and for all body processes. These foods are usually the most economical source of calories. In the form of cereal grains, they are the principal source of food for most of the world's population.

Carbohydrates can be classified into three groups on the basis of their chemical composition.

- *Simple sugars or monosaccharides* (one sugar). All carbohydrates must be broken down into simple sugars to be utilized by the body. *Glucose* is the principal form of simple sugar. It circulates in the blood stream and supplies energy for body activities. Simple sugars, not needed for immediate use, are stored as *glycogen* in the liver. Glycogen can be easily converted back to glucose.
- *Disaccharides* (two sugars). Disaccharides include *sucrose* (beet, cane, and maple sugars), *lactose* (milk sugar), and *maltose* (malt sugar). During digestion, they are broken down into simple sugars.
- *Polysaccharides* (many sugars). The common forms of polysaccharides are *starch, dextrin, glycogen,* and *cellulose.* Starch and glycogen are converted to glucose during digestion. Cellulose is not digestible but provides necessary roughage.

Food carbohydrates, except lactose, are synthesized by plants through the process of *photosynthesis.* Carbon dioxide and water with the aid of sunlight and *chlorophyll* (green pigment) are changed into carbohydrates.

Most plants store their food supply as starch in the seeds, tubers, and roots. This is why vegetables, such as potatoes or carrots, have a higher carbohydrate content than leafy vegetables, such as spinach or lettuce. As the plant ripens, the starch is changed to sugar. This is the reason why fruits are sweeter when ripe.

FUNCTION

Carbohydrate is the main source of energy for the body. It also has a protein-sparing action. If too little carbohydrate is eaten, the body will use protein for energy rather than for growth and maintenance.

When too much carbohydrate is eaten, it is converted and stored as body fat, leading to obesity. Too much carbohydrate is also a contributing factor to tooth decay. Obesity and dental caries are two forms of malnutrition prevalent in Massachusetts.

SOURCES

- *Fruits and vegetables* — these vary in carbohydrate content depending upon the water and cellulose content. Leaves and stalks (celery, cabbage) would be low, while the roots or seeds (beets, parsnips, lentils) would be high. Processing may also increase the carbohydrate content such as in fruits canned or frozen in heavy syrup.
- *Grains and grain products* — flour, bread, macaroni, spaghetti, cereals.
- *Concentrated sweets* — sugar, candy, jelly, jam, syrup. These are basically "empty calorie" foods.

FATS AND OILS

Fats and oils are the most concentrated sources of food energy. Ounce for ounce, they give more than twice as many calories as proteins or carbohydrates.

Deposits of fat provide insulation and protection for the body. For example, fat paddings around the kidneys act as cushions against sudden injury. If more fat is consumed than is needed, obesity will result. Excess protein and carbohydrates also are converted and stored as body fat.

Because they are digested more slowly, fats and oils give staying power to meals. Some fats carry the fat-soluble vitamins — A, D, E, and K.

Fats also supply essential fatty acids that cannot be synthesized by the body. These include *linoleic, linolenic,* and *arachidonic acids.* They are considered necessary for healthy skin, and for normal growth and reproduction.

The fatty acid content of fat is classified as *saturated* or *unsaturated* depending upon its chemical structure. Saturated fats (high content of saturated fatty acids) are mainly from animal sources and are solid at room temperature (butterfat, meat fats). Unsaturated fats (high content of unsaturated fatty acids) are mainly from a vegetable source and are liquid at room temperature (vegetable oils). Investigations as to the relationship of saturated fats to coronary heart disease are in progress.

Sources of fat in the diet include the *visible* fats such as meat fats, butterfat, margarine, lard, vegetable shortenings, and oils. There are also the *invisible* fats found in fish, poultry, egg yolks, olives, nuts, avocados, coconut, chocolate, and peanut butter.

MINERALS

Many different minerals are needed for growth and development of tissue and for functioning of every cell in the body.

IRON

Iron is found in every living cell in the body. It joins with protein to form the hemoglobin of red cells which carry oxygen to all parts of the body and return carbon dioxide to the lungs. It is present as *myoglobin* in the muscle cells to store oxygen needed for muscle contraction. It is a part of certain enzymes which aid in the oxidation of carbodrates, fats, and proteins.

The body uses iron sparingly. When a blood cell is "worn out," it is broken down by the liver or spleen so that the iron can be reused. Very little iron is excreted.

A lack of iron leads to nutritional or *hypochromic* anemia. Symptoms include pallor, fatigue, weakness, and shortness of breath. It is caused by insufficient dietary intake or faulty absorption of iron.

Iron needs are increased by loss of blood such as that following injury, surgery, or during menses. Iron deficiency is found most commonly in women during reproductive years. Adequate iron stores in the body and greater dietary intake are essential during pregnancy. This is a serious concern with teen-age girls.

Iron requirements during infancy are also high. The new-born baby usually has iron stores for the first few months but then must have iron supplied by the diet. Babies who are overfed milk in lieu of other nutritious foods may become anemic.

There are only a few foods which are naturally rich sources of iron. Good sources of iron include meats (particularly liver), egg yolk, green leafy vegetables, dried fruits and legumes, molasses, and whole-grain or enriched cereals and breads.

CALCIUM

Calcium is the most abundant mineral in the body. About 99 percent of it is found in the bones and teeth, giving them form and rigidity. The remaining 1 percent aids in the clotting of blood, maintaining rhythm of the heartbeat, contraction of muscles, normal response of nerves, and activation of certain enzymes.

Bones and teeth may suffer if calcium or phosphorus are lacking. Vitamin D is also necessary in order to use both calcium and phosphorus. *Rickets* in children results from a lack or imbalance of these three nutrients. Adult rickets *(osteomalacia)* may also be due to insufficient calcium, phosphorus, and vitamin D.

Osteoporosis (bone thinning) is another adult disease, more common among older people. The loss of calcium from the bones makes them more fragile and more easily broken. Calcium deficiency is one of the factors involved. Some researchers believe that there is a constant loss of calcium after the ages of 20 to 30 years, and that increased bone mass before age twenty will help to prevent osteoporosis later in life.

Calcium in the diet is found mainly in milk and cheese. Leafy green vegetables, particularly kale, collard, and broccoli, have some calcium — but it would take nine cups of cooked broccoli, for example, to equal the amount of calcium available in a quart of milk. (The calcium in spinach, beet greens, and chard is combined with oxalic acid, which cannot be absorbed by the body.)

It is important that teen-agers (and adults, too) include daily recommended amounts of milk, milk products, or cheese to meet the body's need for calcium.

PHOSPHORUS

Phosphorus is the second most abundant mineral in the body. It is found in all cells. The largest amount is tied with calcium in the bones and teeth giving them strength and rigidity.

Phosphorus has several important functions. It is essential in the energy metabolism of carbohydrates, fats, and proteins. It is a constituent of enzymes needed for glycogen and glucose oxidation, and one of the minerals that assists in maintaining the blood neutrality. It is necessary for the normal response to nerve stimuli and for the contraction of muscles.

Phosphorus is widely distributed in many foods so that a deficiency is not common. Cereals and meats are rich sources; legumes, eggs, milk, and milk products are good sources. Phosphorus is likely to be sufficient when protein foods are adequate.

IODINE

Iodine acts as a "timer" for the body and helps the thyroid gland to regulate the rate at which the body uses energy. It is necessary for the production of the hormone, *thyroxin*, which regulates the rate of oxidation within the cells.

Lack of iodine results in the enlargement of the thyroid gland called *simple goiter*. Goiter is more prevalent in girls and women, and occurs more frequently during adolescence, pregnancy, and menopause.

Iodine is found in the soil and water near the ocean. Sea foods are a rich source. *Iodized* salt has iodine added to it and is the best protection against goiter.

Certain areas of the world, where the iodine content of the soil or water is low, have a higher incidence of *endemic* goiter (native to a region). The Great Lake region of the United States was called the "Goiter Belt." Through the use of iodized salt, this condition was almost eliminated. Consumer awareness is necessary, though, for the continued use of iodized salt to prevent the reappearance of endemic goiter.

FLUORINE

Fluorine is found mainly in the bones and teeth. It helps reduce tooth decay, not only during childhood, but also throughout adult life. It may function in maintaining the bone structure, and help to prevent fragile bones in older adults.

Fluorine is present naturally in some water supplies and may be added to others by the city or town. Many medical and public health studies have clearly demonstrated that water fluoridation is both safe and beneficial. A decrease in tooth decay of more than 50 percent has been shown where fluorine was added to the water supply.

MAGNESIUM

Magnesium is an important constituent of all soft tissue and bone. Its main function is an activator for many enzymes.

Richest sources of magnesium include organ meats such as liver and brains, egg yolk, green leafy vegetables, whole-grain cereals, cocoa, coffee, and tea. Magnesium deficiency in man is rarely seen.

OTHER MINERALS

Other minerals present in the body in large or *macro* amounts include *potassium, sulfur, sodium,* and *chlorine*. They have many important functions in the body. For example, sodium, found in the extracellular fluid, is concerned with the maintenance of water balance. It is generally restricted when edema is present. Dietary intake of these macrominerals is usually adequate under normal conditions.

Other minerals present in the body in trace or *micro* amounts include *chromium, copper, cobalt, manganese, molybdenum, selenium,* and *zinc*. It is difficult to obtain direct evidence of the nutritional role that these minerals play in the body. *Manganese* is known to be needed for normal bone structure. *Copper* is necessary for the utilization of iron in the synthesis of hemoglobin. *Chromium* may have a relationship to carbohydrate metabolism. A varied diet is thought to supply an adequate amount of the microminerals. Green leafy vegetables, fruit, whole-grains, organ meats, and lean meats are good food sources. The microminerals can cause injury or interfere with the utilization of other nutrients when taken in too great amounts. Dietary supplements should be used only under the supervision of a doctor.

VITAMINS

There are a great many vitamins, differing widely in makeup and function. Every one is needed for normal growth and development and for maintenance of health and vigor.

Each vitamin has a very specific function in the body, and no other can take its place. Many work together in certain body functions such as metabolism, and a severe lack of even one over a period of time can cause a deficiency disease.

The vitamins are classified as *fat-soluble* or *water-soluble*. These characteristics affect where they are found in food, preparation and cooking losses, absorption and storage in the body.

Also present in foods are substances called *provitamins*. They are not actually vitamins in their natural form but can be converted to vitamins by the body. For example, *carotene* (yellow pigment in plants) is changed to vitamin A by the body; and *tryptophan* (essential amino acid) is a precursor of niacin.

FAT-SOLUBLE VITAMINS

VITAMIN A

Vitamin A is necessary for healthy skin; for lining of eyes, ears, lungs, and digestive tract; and for helping the body to resist infection. It aids in tooth and bone formation and helps the eyes to adjust more easily to change from bright to dim light. The measurement of the light adaptation is a common method for studying vitamin A requirements.

Because vitamin A is fat-soluble, it is not lost in cooking water. Some dietary fat is needed for its absorption. Butter, enriched margarine, liver, and egg yolk are all good sources of vitamin A. The body takes carotene from dark green leafy and bright yellow vegetables to make vitamin A. The availability of carotene in different foods for body use varies widely.

Extra vitamin A is stored in the liver. Large doses of vitamin A over a long period of time can be toxic. Symptoms include loss of appetite, irritability, skin lesions, loss of calcium from the bones. Carotene is not changed to vitamin A fast enough to become toxic but excessive amounts may produce a yellow skin.

VITAMIN D

Vitamin D regulates the use of calcium and phosphorus in making strong bones and teeth. A lack of vitamin D during the growth period results in *rickets,* with its characteristic *bowlegs.* Teen-agers can develop rickets with an insufficient intake of this vitamin. Even adults need small amounts.

The body makes its own vitamin D when skin is exposed to *ultraviolet light* from the sun. With sufficient exposure, the vitamin D requirement could be met in this way. However, climatic conditions, or other factors affecting the amount of direct sunlight, usually make vitamin D supplementation necessary.

Vitamin D is found naturally in fish liver oils. It is added to milk and commercial infant formulas. Labels on cans, cartons, or caps indicate how much vitamin D has been added.

Excessive amounts of vitamin D are dangerous. It leads to a serious condition called *hypercalcemia.* Vitamin D intake should be restricted to recommended allowances.

VITAMIN E

Vitamin E is a natural antioxidant. It protects fats and vitamin A from destructive oxidation. It strengthens body tissues and membranes, particularly preventing abnormal red blood cell breakdown. A deficiency affects the reproductive system of many animals, but has not been shown in man.

As vitamin E is fat-soluble, it is relatively stable in food preparation. Some loss occurs in deep-fat frying. Cereal seed oils (wheat germ, for example) are the richest sources. However, a varied diet is considered to supply the daily need for vitamin E. No toxic effects have been demonstrated from an excessive intake.

VITAMIN K

Vitamin K is necessary for the normal clotting of blood. A deficiency of this vitamin prolongs the coagulation time which can be serious if bleeding occurs.

Since vitamin K is fat-soluble, there is little loss in cooking. It is found in foods, especially leafy vegetables, and can also be synthesized by bacteria in the intestines. The daily allowance for human consumption has not been established. The average diet is considered to contain adequate amounts. Excessive doses of vitamin K can have toxic effects.

WATER-SOLUBLE VITAMINS

ASCORBIC ACID (Vitamin C)

Ascorbic acid is essential for connective tissue. It prevents fragile blood vessels and easy bleeding, aids in the healing of wounds, and strenghthens teeth and bones. A lack of vitamin C can cause spongy, bleeding gums; a tendency to bruise easily; painful, swollen joints.

Severe ascorbic acid deficiency results in scurvy. Scurvy is seldom seen today. However, the recently completed Ten-State Nutrition Survey indicated that 16 to 19 percent of the population studied showed signs of vitamin C inadequacy.

Vitamin C is easily destroyed by air and heat. Foods rich in vitamin C should be served raw as often as possible. They should not be prepared too far in advance, nor stirred much during cooking. Adding baking soda during cooking destroys vitamin C.

Citrus fruits are a very good source of vitamin C. Canned and frozen citrus fruits and juices may be used instead of fresh ones. Tomatoes, peppers, cabbage, boiled or baked potatoes, and melon also supply ascorbic acid.

Vitamin C is not stored in the body and must be supplied daily.

THIAMINE (Vitamin B-1)

Thiamine is essential for a healthy nervous system. It stimulates the appetite and aids digestion.

It is necessary for the metabolism of starches and sugar. Adolescents who eat large amounts of sugar, candies, cookies, and sweet drinks need extra thiamine.

Diets mildly deficient in thiamine can cause a loss of appetite, apathy, fatigue, irritability, and even mild depression. Severe dietary restriction results in *beriberi*. This disease is rarely seen in the United States, but is still very common in the Far East.

Except for lean pork, no one food contains much vitamin B-1. Therefore, many different foods are needed to make up the day's supply. Whole-grain or enriched breads and cereals and milk should be included daily. Teen-agers on reduction diets often lack thiamine.

Thiamine, which is water-soluble, is lost in cooking water. Baking soda added to foods also destroys thiamine, as does cooking at high temperatures.

Thiamine is not stored in the body. It must be supplied every day.

RIBOFLAVIN (Vitamin B-2)

Riboflavin is essential for metabolism of proteins, fats, and carbohydrates. It is necessary for cellular growth and promotes healthy skin, eyes, and mucous membranes. When the dietary intake is low, cracks may appear at the corners of the mouth; the tongue may be swollen and sore; there may be a sensitivity to light.

The best sources of riboflavin are milk, cheese, eggs, meat (especially liver), and green leafy vegetables. It is easily destroyed in sunlight but is stable to heat. As riboflavin is water-soluble, there may be losses in cooking.

Riboflavin is not stored by the body. It must be supplied every day.

NIACIN

Niacin helps the normal functioning of skin and digestive tract. It is essential for metabolism of protein and fat and for converting carbohydrate into energy. Severe niacin deficiency results in *pellagra*.

Since niacin is water-soluble, small amounts of water should be used in cooking. It is stable to heat so there is little loss in baked, roasted, or frozen foods.

Niacin is found in meat, poultry, peanuts, dried peas and beans, and whole-grain cereals. The body can synthesize niacin from the amino acid, *tryptophan*. Milk and dairy products are good sources of tryptophan.

Niacin is not stored in the body. It must be supplied every day.

FOLACIN (Folic Acid)

Folacin is necessary for amino acid metabolism and blood cell formation. A deficiency can result in anemia, diarrhea, and *glossitis* (smooth tongue).

Folacin is water-soluble and easily destroyed by heat and air. It is widely available in foods. Organ meats such as liver and kidney, yeast, and leafy green vegetables are rich sources.

Folacin is not stored in the body and must be supplied daily.

PYRIDOXINE (Vitamin B-6)

Pyridoxine functions as an enzyme in the body use of proteins, carbohydrates, and fats. It is particularly important in protein metabolism. It is necessary for the conversion of tryptophan to niacin.

Pyridoxine is water-soluble and losses may occur in cooking. It is found in meats, fish, vegetables, fruits, and whole-grains. A varied diet would supply an adequate intake of vitamin B-6.

Vitamin B-6 is not stored in the body and must be supplied daily.

CYANOCOBALAMIN (Vitamin B-12)

Cyanocobalamin is essential for red blood cell formation. It participates in protein, carbohydrate, and fat metabolism and is necessary for growth and healthy nerves. A deficiency of vitamin B-12 leads to *pernicious* anemia, a serious disease of the blood. The name cyanocobalamin indicates that the mineral, cobalt, is part of its chemical composition.

Vitamin B-12 is water-soluble and can be lost in cooking water. It is found in foods of animal origin — mainly liver, meats, eggs, and milk. It is not stored in the body and must be supplied daily.

OTHER WATER-SOLUBLE VITAMINS

Other water-soluble vitamins known or thought to be essential for man include *biotin, choline, inositol, para-aminobenzoic acid*, and *pantothenic acid*. The roles of some of these vitamins have been defined, but with others, the function is not fully understood. For example, *biotin* participates in the synthesis of fatty acids, but the function of *inositol* in man has not been proven. A varied diet will supply the daily requirements for these vitamins.

Vitamin pills, capsules, and concentrates may be ordered by physicians when an extra supply of any single vitamin or a number of vitamins is needed. These do not take the place of an adequate, well-balanced diet. There are many little-known but essential vitamins that are found in good meals but are not yet marketed commercially.

OTHER DIETARY CONSIDERATIONS

There are other factors that must be considered in planning a well-balanced diet. They are vital to the nutritional health of the body.

WATER

Although not a food itself, water is absolutely essential to the use of food in the body and to the maintenance of life itself. In fact, water is often called a *noncaloric nutrient*. You can live a month or longer without food, but only a few days without water.

Water is a part of every tissue of the body, even bone. About one hundred pounds of the body of a 150-pound man is water.

Water is supplied in three ways. It comes through fluid foods such as soup, beverages, and water; from solid foods like fruits, vegetables, and even breads; and from the body tissues themselves, for water is produced in the process of metabolism.

Four to six glasses of fluids a day, including beverages, are suggested for a teen-ager. On hot days, or with a very active program, more may be needed. In schools lacking adequate drinking facilities, special attention should be paid to meeting the students' need for water.

FIBER OR CELLULOSE

Fiber, though not digested by the body, is necessary for bulk and stimulation of the digestive tract. A well-balanced diet, rich in raw fruits and vegetables, will supply the necessary amount in an attractive, tasty way.

CALORIES

Calories are not nutrients. They do not go into the structure of the body as minerals do. Calories are measurements of (1) the amount of heat or energy needed by the body for all its activities and (2) of the amount available in foods.

All foods supply calories. Foods rich in fats provide more calories in each serving than any other foods. Sweet, sugary foods are also high in calories. Foods with a high water content like raw fruits and vegetables have the least calories but are high in minerals and vitamins.

Everyone needs calories every minute of his life, awake or asleep. The number of calories needed each day depends upon body size and activity. The calorie requirement is least during sleep, and most when extremely active. Extra calories are stored until needed. An overweight teen-ager needs to decrease his calories by limiting (not omitting) the foods high in fat and carbohydrate (sugar and starch); the underweight teen-ager needs to increase these foods.

Scientists are proposing to change the unit of measure from calories to *joules*. (One calorie equals 4.1855 joules.) They believe that this would result in a uniform language since these measurements are already widely used in other countries. If accepted, all food tables would need revision.

BASIC FOUR FOOD GROUPS

The United States Department of Agriculture has developed a food pattern called the *Daily Food Guide* which makes it easier to include all of the nutrients needed each day. It is often referred to as *The Basic Four*.

Within this guide, foods are divided into four separate groups. The minimum amounts and kinds of foods from each group to be eaten are listed. The guide is simple to remember and easy to follow. Of course, *other foods should be added as needed to complete the meals and supply additional energy.*

MILK GROUP

Some milk is needed for everyone:

Children under nine	2 to 3 cups
Children nine to twelve	3 or more cups
Teen-agers	4 or more cups
Adults	2 or more cups

It is not necessary to take all of this milk as a beverage. Foods made with milk, such as puddings, soups, creamed dishes, ice cream, and all varieties of cheese except cream cheese, may be substituted.

MEAT GROUP

Two or more servings a day are recommended. This group includes beef, veal, pork, lamb, poultry, fish, and eggs. Dry beans, dry peas, and nuts may be used as alternates.

VEGETABLE — FRUIT GROUP

Four or more servings a day are recommended.

Include:

- A citrus fruit or other fruit or vegetable important for vitamin C daily.
- A dark green leafy or bright yellow vegetable for vitamin A at least every other day.
- Other fruits and vegetables, including potatoes.

BREAD — CEREAL GROUP

Four or more servings a day are recommended. The foods in this group should be whole-grain or enriched.

With the older mature student, the nutrient approach may be more effective. However, The Basic Four is a valuable teaching aid and a norm for evaluating dietary intakes or comparing other factors influencing eating habits.

3

SOME FACTORS INFLUENCING NUTRITIONAL HEALTH

SUPERMARKET

Teen-agers must understand the relationship of food and nutrition to the physical and psychological health of a society or nation. They must be helped to develop a social consciousness for participating intelligently in activities affecting the nutrition of all people.

Three of the educational goals for Massachusetts emphasize the role that schools play in advancing these ideals:

- Citizenship in a democratic society
- Respect for the community of man
- Individual values and attitudes

In nutrition education, the teacher defines the right of all citizens to the means for obtaining optimum health throughout life. He acquaints the students with the many resources available to reach this objective and encourages their active participation in affecting changes.

SOME FACTORS INFLUENCING WHAT PEOPLE EAT

Many factors influence what people eat and how they prepare and serve food. All families have their own traditional food patterns. These are usually a combination of the old and new, adapted to present living conditions. Some of these factors include:

- *Socio-economic status.* People existing at poverty levels may have to supplement an inadequate food budget with government donated foods or food stamps. Families with more adequate incomes, or working mothers, may make greater use of convenience foods. Accelerated family life styles may change the customary eating pattern to snacking or to four or five smaller meals a day.
- *National and racial background.* Families who have moved from other parts of the country or from overseas have their traditional meals or foods. Some may spend too great a proportion of their money for familiar foods to make the strange community feel more like home.
- *Cooking skills and facilities.* Insufficient knowledge of food preparation or lack of equipment are important factors with many low income families and with the elderly who must use government donated foods.
- *Psychological aspects of food.* According to Dr. Bruno Bettelheim, a distinguished child psychologist, "*Eating and being fed are intimately connected with our deepest feelings. They are the most basic interactions between human beings, on which rest all later evaluations of ourself, of the world, and of our relationship to it.*" The psychological aspects of food have a great influence on teen-age eating habits. A high school student speaking before a national nutrition conference told of the many pressures of her age group — peer pressure for conformity, social pressure for Saturday night dating, intellectual pressures to get into college, draft pressures facing boys. She pointed out the desire for a slim figure and the boredom of baby-sitting with the proximity of a full refrigerator. She concluded, "*Boredom, pressures, nerves — all these are roads leading to the refrigerator and malnutrition.*"
- *Religious practices.* Religion plays an important part in food choices. For example, Jewish families, particularly Orthodox Jews, follow detailed dietary laws which prohibit eating pork or shellfish and from using meat and dairy products at the same meal. All meats must be processed in a special way called "Kosher." The Moslem religion, too, excludes pork from the diet, and the Koran indicates that meat must be processed as in the Jewish dietary laws. Certain religious sects restrict the use of meat and other foods on holy days; while others totally eliminate meat from their diet.
- *Industry.* Food processors and purveyors influence what people eat through convenience foods, supermarket displays, merchandising "give-aways," and advertising.

AVAILABILITY OF FOODS AFFECTS EATING HABITS

Modern agricultural and technical research and training have given us the greatest food production capacity ever achieved. Farm output per man hour has increased 250 percent in just fifteen years. Before 1850, over 80 percent of the nation's working force was involved in food production; now, only 6 percent is required. In addition, 20 percent of the farms yield 90 percent of the food supply.

Food processing is a multibillion dollar industry. It includes all the things that make our foods easier and safer to use, such as canning, drying, freezing, pasteurizing, homogenizing, and enriching. It also includes packaging and labeling.

New methods are being used to process foods and older techniques are being improved. Controlling temperature and moisture during cold storage retards spoilage of fresh foods. *Aseptic* canning (sterilizing container and contents separately) prolongs milk life for several months.

Quick freezing has brought many new frozen products. *Cryogenic* freezing methods (temperatures below minus 100° F.) may give us frozen lettuce and salad mixes. Freeze-drying is providing chicken in dry soup mixes and many items for the camper.

Food additives may improve the nutritive value, act as an emulsifier, enhance flavor and color, or deter spoilage. Synthetic foods are available such as meatless meats, nondairy coffee whiteners, imitation and filled milks.

Efficient transportation systems make it possible for consumers to buy most of the same foods whether they live in rural or urban areas. Milk can be transported from cow to final container without being lifted manually or touched by human hands. "Piggyback" service makes it possible to transport highway trailers on railway flat cars — with only minutes to load and unload. LASH (lighter aboard ship) is trying a similar procedure with barges and ships.

STATE-NATIONAL FOOD PROGRAMS

America has the ability to produce more food than it can use. It has the most efficient distribution system in the world. All Americans should be well fed. Yet, millions of people in this country are hungry or malnourished.

To combat hunger and malnutrition in the United States, Congress has authorized many beneficial programs. They could assure all citizens an adequate diet every day. The problem rests in telling people what is available, motivating active support by local officials, and adequate funding.

DONATED FOODS (Commodity Distribution Program)

Donated foods is the oldest assistance program for needy families and other eligible agencies. In its beginning, the foods distributed depended upon surplus crops or price controls. Now, nutritional needs are also considered. Eligible agencies include:

- Schools (public or nonprofit private) serving meals to children of high school age or younger; or to senior citizens under the Elderly Feeding Program.
- Institutions (public or nonprofit private) serving meals or supplementary feedings to children under the Special Food Service Program for Children; or maintaining established feeding programs for needy persons.
- Department of Public Welfare for distribution to needy families.
- Disaster organizations for distribution to disaster victims.
- State correctional institutions.
- Health clinics and centers for distribution to high risk health groups.

Donated foods is a cooperative effort at the federal, state, and local levels. The federal government pays for the cost of the food and transportation to the state; the state and local governments share the cost of storage and transportation within the state.

ELDERLY FEEDING PROGRAMS

Malnutrition is common among the aged. It results from the following:

- A lack of knowledge of nutritional needs.
- Diminished body absorption of the nutrients.
- Insufficient money to purchase necessary food.
- Inadequate cooking facilities.
- Inability to shop.
- Lack of adequate teeth or dentures.

In addition, many older Americans live by themselves, and the resulting loneliness can cause a loss of interest in food.

Efforts are being made to improve the nutritional health of the elderly through feeding programs. An experimental portable meals program (meals-on-wheels) has been started in some communities. It attempts to care for the ill, handicapped, and elderly in the community, rather than in an institution, by delivering regular or special diet meals directly to the home.

Massachusetts was the first state to provide low-cost meals to the elderly in schools or other nonprofit agencies. Elderly feeding now has become a part of federal legislation. The participant pays a small fee; federal and state appropriations support the remaining costs. The nutritional content of the meal is based on the TYPE A lunch served in schools with additional amounts of protein and modified for geriatric needs. The social aspect of the meal is almost as valuable as the food served.

Teen-age volunteers have been helpful in elderly feeding programs. They deliver meals to the homes and assist with educational projects in the schools.

FAMILY FOOD DONATION PROGRAM

Donated foods from the federal government are given free to low income families. About thirty pounds of food per person are allocated each month. They include a variety of canned and staple items. Because of transportation and storage problems, fresh meats, fruits, and vegetables are rarely available.

The donated foods are meant to supplement family purchases. If they are distributed at the recommended rates, and accepted and used by the recipients, a diet that comes very close to meeting full nutritional needs will be provided.

Factors affecting the amount of donated foods used include:

- Local agency's ability to handle and store all the donated foods offered.
- Proximity of the family to distribution center and transportation facilities.
- Storage and cooking facilities in the home.
- Size and weight of packaging.
- Family's understanding of how to eat well.
- Homemaker's knowledge of how to prepare and serve the foods offered.
- Program mechanics — making families aware of donated foods and the problem of filing applications.

Educating families as to what foods should be eaten each day, and why, and teaching them how to use the foods are vital needs. Teen-agers could assist with these projects on a voluntary basis. They could also help with deliveries.

FOOD STAMPS

The food stamp program helps to stretch the food money of low income families. Food stamps are purchased at a local issuance office, or the cost of the stamps can be deducted from welfare checks. Extra or free stamps are added depending upon the family size and economic need. The stamps can be used in local cooperating stores to purchase food for the family. Elderly persons can use them for some ready-prepared meals.

Food stamps are easy to use although not all stores accept them. They give families the opportunity to purchase fresh foods and dairy products as well as staple items. However, since stamps must be bought on a monthly basis, many families cannot afford the initial outlay of money. In addition, unless food stamp usage is accompanied by nutrition education, there is no assurance that family eating habits will improve.

SCHOOL BREAKFAST

The breakfast program helps to close nutrition gaps in child feeding. It provides a nutritious meal to needy children or to those who must travel long distances to school. A good breakfast can also benefit the many other students arriving without a morning meal. In Massachusetts, school breakfast was mandated in all public schools with high needy enrollment as of September, 1972.

Government assistance is available through cash subsidies, donated foods, and money for equipment. To be eligible for reimbursement, the breakfast must meet an established pattern.

SCHOOL LUNCH

The school lunch program has two stated objectives:

- To safeguard the health and well-being of the nation's children.
- To encourage the domestic consumption of nutritious agricultural commodities and other foods.

It attempts to reach these goals by serving a well-balanced, appetizing lunch at a cost that the majority of children can afford to pay; and free or at a reduced price to those unable to pay the full charge.

In Massachusetts, the serving of a nutritious noon meal was mandated in all public schools on a one-session day by September, 1972; and in all public schools by September, 1973. This law was necessary so that communities would fulfill their obligation to feed needy students. With permissive legislation, the Commonwealth was reaching only 25 percent of its known children from low income families.

Government assistance is available through cash subsidies, donated foods, and money for equipment. To be eligible for reimbursement, the lunch must meet the TYPE A meal pattern.

SPECIAL FOOD SERVICE PROGRAMS FOR CHILDREN

This program makes food service available for preschool as well as older children from low income families, or from areas with many working mothers. Centers, settlement houses, summer camps, and other institutions providing custodial day care may offer as many as three meals per day, and two supplementary feedings. The government shares the cost through cash subsidies, donated foods, and money for equipment. To be eligible for reimbursement, the meals and supplementary feedings must meet established patterns.

SPECIAL MILK PROGRAM

The primary aim of the special milk program is to improve the nutritional well-being of children by creating good milk-drinking habits. Increased consumption of milk is encouraged by decreasing the selling-price or giving it free to those unable to pay. Cash subsidies are provided to local schools and other child care centers to assist with the program costs.

Some people question the fat content of whole milk, and suggest that nonfat fluid milk be used. Federal regulations permit reimbursements on fluid whole, lowfat, and skim milks or cultured buttermilk. The butterfat of milk does carry some essential fatty acids and vitamin A. In fact, Dr. Arnold Schaefer, Ten-State Nutrition Survey Director, has said that whole milk may be the most important source of vitamin A for low income families. If lowfat or skim milks are used, they should be fortified with vitamin A.

SUPPLEMENTAL FOOD PROGRAM

The supplemental food program reaches high risk health groups with extra donated foods. These groups include expectant and nursing mothers, infants, and very young children from low income families. It helps to supply the foods necessary for early growth and mental development.

WORLD FOOD-NUTRITION PROGRAMS

Many programs have been developed to improve world health and nutrition. Malnutrition is recognized by many experts as a barrier to both the social and economic growth of a country.

AID — Agency for International Development

Part of the U.S. Department of State. Helps developing countries to be self-reliant by using their own knowledge and resources in the areas of agriculture, education, and health.

CARE — Cooperative for American Relief Everywhere

Voluntary organization of twenty-six American service agencies. Helps countries in Central and South America, the Near East, Africa, and Asia. Most CARE packages contain food, but may also provide such items as tools, seeds, school furniture, and books. Donors can designate gift as well as recipient.

FAO — Food and Agricultural Organization

Objective is to improve world agriculture, forestry, and fisheries resulting in increased food production of better quality and nutritive value.

FFHC — Freedom from Hunger Campaign

Established to help less-developed nations increase their own food production.

INCAP — Institute of Nutrition for Central America and Panama

Carries out research and training, and provides advisory services in nutrition to these countries.

PAHO — Pan American Health Organization

Oldest international health organization. Promotes physical and mental health of people in the Americas.

UNESCO — United Nations Education, Scientific, and Cultural Organization

United Nations agency mainly responsible for education. Works cooperatively with other international organizations.

UNICEF — United Nations International Children's (Emergency) Fund

Only international agency whose sole purpose is concern with the needs of children. Established in 1946 for emergency supplies due to war. "Emergency" now dropped from name, but initials remain the same.

WHO — World Health Organization

Promote international health. Importance of nutrition for health recognized from the beginning.

YWA — Young World Appeal

Involve youth of the world in economic and social developments to eliminate hunger.

NUTRITION EDUCATION PROGRAMS

Food and health programs need the support of nutrition education. People should be able to make wise decisions about their food choices. They need to recognize the relationship of the food they eat to optimum health. Nutrition education in Massachusetts is shared by many agencies. These include:

- Cooperative Extension Service
- Department of Education
- Department of Public Health
- Department of Public Welfare
- Hospital nutrition clinics
- Maternal and Child Health Service
- New England Dairy and Food Council and other industry
- Utility companies
- Visiting nurse associations

These agencies provide many services. For example, the Cooperative Extension Service helps homemakers to learn about food and its relationship to family health through their people-to-people program; the Department of Education assists with curriculum development, teacher training, and supervises nutrition education in the schools; the New England Dairy and Food Council cooperates with schools, industry, and health professions, and conducts workshops to update teaching techniques.

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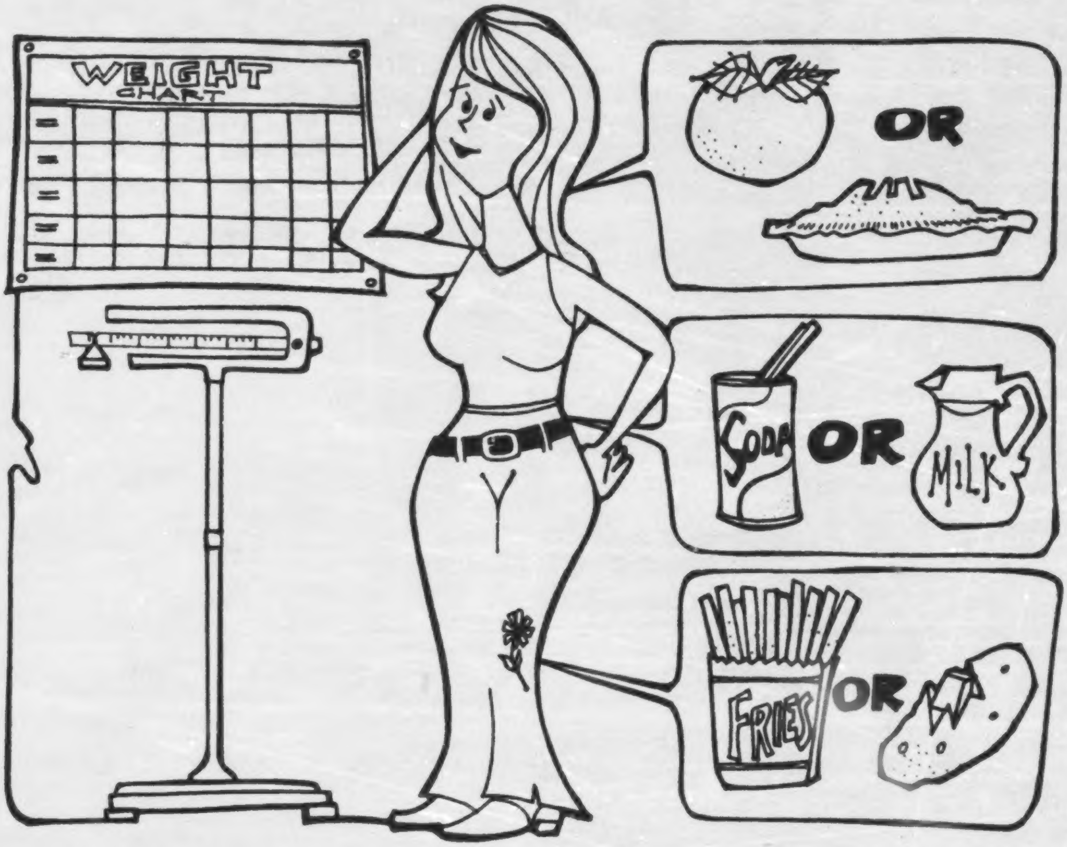
CONTEMPORARY ISSUES



Teen-agers must recognize that *physical and emotional well-being* are essential for attaining their present educational goals as well as for achieving *occupational competence* in later life. They must realize, too, that adequate nutrition is an integral and vital component of good health. Educational programs should:

- Promote and support proper eating habits.
- Help students to distinguish fact from opinion in the mass of nutritional information available.
- Train students to be wise consumers.
- Help students to understand the environment.
- Foster attitudes in the wise use of food resources on an individual and collective basis.

ECOLOGY AND NUTRITIONAL HEALTH

Food production and usage are vital concerns in ecology. Without sufficient food supplies, we cannot live. A wise utilization of food resources is essential if we are to survive.

A panel of experts at the 1969 White House Conference on Food, Nutrition and Health concluded that (1) this country currently produces sufficient food to supply the nutritional needs of every citizen; and (2) that it has the ability to produce all of the nutrients our expanding population will require for the foreseeable future.

In reaching these conclusions, the panel did not consider food needs outside of the United States. An adequate food supply is not available to all people. Only ten countries have a surplus of food and these contain only 15 percent of the world's population. Two-thirds of the world's population live in countries with nutritionally inadequate national diets.

Increased research and technological aid are necessary to provide high quality food in adequate amounts for all people. Some of the possibilities suggested, or already being tested include:

- Recycling cereal by-products for high-nutrient cattle feed.
- Conversion of soybean, peanut, and petroleum derivatives into textured proteins of higher biological value.
- Genetic modifications to produce high-protein grains.
- Increased production of synthetic foods.
- Development of aquaculture (fish farming) — for example, shrimp farming in the South.
- Better use of the photosynthetic process of plants — for example, the use of chlorophyll-bearing algae of the sea.

Crops play an important role in the cycle of living things on the earth through photosynthesis. Without the continual conversion of carbon dioxide to oxygen by plants, our air pollution might be fatal.

FERTILIZERS AND PESTICIDES

Chemical fertilizers and pesticides are now considered by some people to be water and soil pollutants. In addition, pesticides are said to leave harmful residues on foods.

Most agricultural scientists believe that the scientific evidence for the necessity of chemical fertilizers and presticides to produce sufficient food far outweighs the possibility of harmful effects. Dr. Norman E. Borlaug, 1970 Nobel Peace Prize winner, addressing the United Nations Food and Agricultural Organization, said, *"If agriculture is denied the use of these chemicals . . . . . then the world will be doomed not by chemical poisoning but from starvation. If the use of pesticides in the U.S.A. were to be completely banned, crop losses would probably soar to 50 percent, and food prices would increase fourfold to fivefold."*

Problems for ecology may be in finding new and safer chemicals which require fewer applications, but do not decrease food production.

WASTE POLLUTION

Food production and usage contribute to environmental pollution. Waste disposal and use of detergents are of particular concern.

Students should be encouraged to analyze environmental problems and to seek solutions. Some of the corrective actions for waste disposal in use, or under consideration, include:

- Recycling of foil containers
- Reverting to "returnable" bottles
- Reuse of paper, tin, and plastics
- Using "edible" plates
- Developing "self-disintegrating" dispensers

The school cafeteria provides a laboratory for study of waste disposal in feeding large numbers of people.

FOOD FADDISM

The prevalence of nutritional misinformation is a serious problem. The United States Department of Agriculture has reported that 10 million Americans waste 500 million dollars a year on fad diets, fake pills, and useless health devices.

Much misinformation is based on half-truths. The difficulty rests with separating fact from fiction. Food fads and diets are not dangerous unless essential nutrients are omitted so that health is impaired, or the reliance on food to cure medical ills results in the failure to seek early medical advice.

- *Health foods.* Health is the result of many factors — not just food. All edible foods eaten in proper amounts promote health regardless of where they are grown or purchased. The federal Food and Drug Administration and the American Medical Association state that "health" foods are misnamed. They are also very costly.
- *Organic foods.* This term refers to foods grown in soil that has been fertilized with organic manures or composts, without the use of chemical fertilizers or pesticides. The type of fertilizer used has not been shown to influence the fat, carbohydrate, or vitamin content of food. Recent research indicates that the protein content of certain strains of rice can be increased with heavy chemical fertilization. The amounts of nitrogen used were far greater than can be obtained from organic fertilizers. Fertilization does influence the mineral composition of food.

For example, food grown in a soil with more iodine, such as near the sea coast, will give more of this mineral. However, there is no significant nutritional difference in foods grown with chemical or organic fertilizers which supply the same amounts of available inorganic compounds. The major difference lies with the crop yield. It is impossible to grow sufficient food to feed world populations without the use of chemical fertilizers.

- *Natural foods.* This term generally refers to organic foods, which in addition, have no substances (nutritive or non-nutritive) added during processing. If even salt or sugar is used in these foods, they are, in reality, no longer "natural" foods.
- *Zen Macrobiotic Diet.* This diet represents an extreme in the trend toward natural and organic foods. It consists of ten levels. The follower progresses through each stage until he reaches the highest level, which is an all-cereal diet. The philosophy is that disease (including cancer) can be cured with proper therapy — natural food, no medicine, no surgery, and no inactivity. The Council on Foods and Nutrition of the American Medical Association states that the Zen Macrobiotic Diet *"is one of the most dangerous dietary regimens, posing not only serious hazards to the health of the individual but even to life itself."*

WEIGHT REDUCTION

Almost 60 percent of the American public is looking for an easy way to lose excess poundage. Teen-age girls are particularly susceptible to "crash" reducing diets for quick weight loss.

A standard for ideal weight is difficult to establish. It varies depending upon skeletal and muscular structure. There are three basic body builds:

- *Ectomorphic* — long and lean, seldom overweight
- *Mesomorphic* — heavy bone and muscle structure, scales read high but not from fat
- *Endomorphic* — soft, rounded body build, well covered with fat

Height-weight tables should make allowance for these body builds. The "mirror" test is often recommended — if you look fat, you probably are fat. Research studies frequently use the "scientific pinch" — a measurement of the fat pad just below the skin with *skinfold calipers.*

Any regimen for weight loss should be under medical guidance. A common sense approach is to eat a variety of foods, using smaller portions, particularly of higher caloric items. Each extra 3,500 calories consumed, daily or weekly, results in one additional pound of body fat. Cutting down 100 calories a day, over body needs, means a weight loss of almost one pound per month — or ten to twelve pounds per year. Weight lost gradually, through a change in food habits, is more apt to be permanent. Quick weight loss, through "crash" dieting, is generally regained when the diet is stopped.

Teen-agers, particularly, need help in setting realistic goals for weight loss. Because of rapid growth and development during adolescence, their nutrient intake must be adequate even if the calories are decreased. They need the sympathetic encouragement of parents, teachers, and other adults for a moderate caloric restriction, increased physical activity, and avoidance of fad dieting.

Some of the popular reduction diets recommend a wide deviation from normal consumption of nutrient groups:

- *Air Force* — high protein, low carbohydrate (disclaimed by the Air Force)
- *Calories Don't Count* — high protein, low carbohydrate
- *Doctor's Quick Inches-Off* — high carbohydrate, low protein
- *Doctor's Quick Weight Loss* — high protein, low carbohydrate
- *Drinking Man's* — high protein, low carbohydrate, alcohol as desired
- *Mayo* — high protein, low carbohydrate (disclaimed by Mayo Clinic)
- *Rockefeller* — high carbohydrate, low protein

Quick weight reduction from low carbohydrate diets usually results from loss of water rather than body fat. Low protein diets generally lack sufficient iron and can lead to anemia. High protein diets (which are usually high in fat content) can be hazardous for people afflicted with gout, diabetes, or kidney problems. Fortunately, these fad diets are so monotonous that they are not adhered to for long periods of time.

Other reduction diets advocate the limitation of food intake to one or two items such as the *Banana and Skimmed Milk Diet* (one quart of nonfat milk and six bananas daily) or the *Kempner Rice Diet* (unsalted rice, fruit, and fruit juices) which was originally used to control high blood pressure.

Some reduction diets restrict caloric intake but add "miracle" foods such as *grapefruit* (to oxidize body fat), *lollipops* between meals (to cut down craving for sweets), or two 8-ounce glasses of *chilled water* before meals (to make you feel "fuller" and eat less).

The use of *pills* for weight reduction is not recommended unless carefully controlled by a qualified physician. Reducing pills can contain any of the following:

- *Diuretic* — to stimulate kidneys and force out water
- *Laxative* — to simulate digestive tract and force out food and fluid
- *Amphetamine* — to depress appetite and act as a stimulant

They may deplete the body of essential elements such as potassium; deprive the body of needed nutrients from the food eaten; irritate the gastrointestinal tract; or become addictive.

CONSUMER PROTECTION FOR FOODS

Foods for human consumption are probably better protected than any other consumer goods. Most interstate controls are administered through the United States Department of Health, Education, and Welfare (HEW) and the United States Department of Agriculture (USDA). For example, the *Food and Drug Administration* (FDA) of HEW checks purity, standards, and labeling of foods under its jurisdiction moving in interstate commerce. The *Meat Inspection Agency* of USDA inspects wholesomeness of domestic and imported meats and meat products.

Some of the controls for maintaining quality and sanitation standards include:

- More than 350 federal grade standards and specifications for meats, poultry, dairy products, fruits, and vegetables.
- City ordinances for production and marketing of milk.
- Federal Food, Drug, and Cosmetic Act of 1939 prohibiting movement of adulterated and misbranded foods interstate. Many states have adopted legislation similar to the federal act.
- Federal Meat Inspection and Poultry Product Inspection Acts regulating wholesomeness of these products transported interstate.
- Federal Wholesome Meat Act of 1967 requiring state inspection of meat plants within states, at least equal to federal inspection.

The size and value of weights and measures are established by Congress. *The United States Bureau of Standards* maintains these standards. Many foods are sold using a combination of weight, measure, and count. It is the state's responsibility to fix specifications for these weights, measures, and counts. Federal law precludes the use of misleading packaging (such as false bottoms) for foods shipped interstate, but does not have jurisdiction for foods produced and sold within state boundaries.

In Massachusetts, there are several agencies that process consumer complaints. These include the Food and Drug Administration (federal and state), the Massachusetts Consumer Council, the Consumers Protection Division in the Department of the Attorney General, and the Better Business Bureau.

FOOD LABELING AND OTHER GUIDELINES

Labeling of foods transported interstate is controlled by the federal Food and Drug Administration, and many states have similar legislation. Information must be accurate, in English, and include:

- Name of product
- List of ingredients, in descending order of amount, unless standard of identity has been set
- Variety, style, or packing medium
- Net weight or volume
- Name and address, including zip code, of manufacturer, packer, or distributor
- List of dietary properties if important
- Artificial color, flavor, or preservative
- Low quality or loose packing

The White House Conference on Food, Nutrition and Health made a number of recommendations concerning labeling, additives, fortification, safety, and quality. As a result, the federal Food and Drug Administration is developing constructive guidelines for the food industry and public. Some of these include:

- A review of the 1940 standards for the enrichment of flour and related cereal products

- Nutritional guidelines for food products
- Informative labeling to include serving size, number of servings per container, nutritional analysis, calorie content, and shelf-life date
- Discontinuing use of Minimum Daily Allowance (MDR); and use of United States Recommended Daily Allowance (U.S.RDA)
- Review of chemical additives categorized as GRAS (generally recognized as safe)

When established, nutrition labeling will be voluntary. However, if adopted by a manufacturer, a standardized form will be used with uniform nutrient listing in terms easily understood by the consumer. Nutritional guidelines for products will establish nutrient minimums for certain classes of foods. Guidelines for some precooked frozen dinners have already been introduced.

FOOD FOR SPACE TRAVEL

The National Aeronautics and Space Administration (NASA) insisted that food for space flights be tasty as well as nutritious. Many of the foods were developed by the United States Army Laboratories in Natick, Massachusetts. Problems were weight and volume, storage facilities, extremely high temperatures, water for rehydration, and a weightless environment.

With each space project, new feeding systems were introduced. They included:

- Sterile semisolid foods
- Bite-sized dehydrated foods
- Precooked dehydrated foods
- Thermally stabilized, flexibly packaged foods
- Intermediate moisture foods

Semisolid and dehydrated foods withstand high temperatures the best. Crumbling of food in a weightless environment was a difficult problem to overcome. Most bite-size pieces of food are covered with a coating compatible with the food item.

A variety of feeders have been used. The most acceptable was a "spoon and bowl" type, rectangular, zero gravity feeder developed by the Air Force. It proved that food could be consumed with a spoon at zero gravity provided that it was not completely liquid.

5

SCHOOL FOOD SERVICES — A MEMBER OF THE TEAM

JUICE
PEAS
CORN
MENU
ON
TUES
WED
THURS
FRI
PEACH
TUNA
MILK

The school food service program has two main objectives in nutrition education.

1. To develop good food habits and attitudes that will result in an intelligent selection and consumption of nutritious foods throughout life.
2. To insure that each student starts the day with a good breakfast and has an adequate lunch while at school.

TYPE A MENU PATTERN

The menu pattern was established by the United States Department of Agriculture and the National Research Council. It serves as a guide for planning well-balanced, nutritious meals which supply the kinds and amounts of food that children need. The Type A lunch must provide the following quantities of food:

- Two ounces cooked, lean meat, poultry or fish; or two ounces of cheese; or one egg; or one-half cup cooked dried beans or dried peas; or four tablespoons of peanut butter[1]; or an equivalent quantity of a combination of two of these items. To meet this requirement, these foods must be served in a main dish, or in a main dish and one other menu item.
- Three-fourths cup serving consisting of two or more vegetables or fruits, or both. Full-strength

vegetable or fruit juice may be counted to meet not more than one-fourth cup of this requirement.

- One slice whole-grain or enriched bread, or the equivalent.
- One teaspoon butter or fortified margarine.
- One-half pint whole, skim, or low fat milk, or cultured buttermilk, used as a beverage.

Slightly larger servings are necessary to meet the requirements of teen-agers. It is also recommended that the Type A lunch include a source of vitamins A and C and several foods for iron each day.

A GOOD BREAKFAST TO START THE DAY

Every student should start each morning with a good breakfast. A 10-week, teen-age breakfast study made at the University of Iowa showed that students who skipped breakfast took longer to make decisions, were less steady, and did less work. Eating a good breakfast made sharper thinking and acting students, and calmer and steadier teen-agers.

A good breakfast includes:

- Fruit or juice
- Cereal
- Bread in some form
- Milk

A protein food such as egg, cheese, or meat should be included often. The minimum school breakfast pattern authorized for reimbursement by the United States Department of Agriculture includes fruit or fruit juice, cereal or bread equivalent, and one-half pint of whole, skim, or low fat milk, or cultured buttermilk.

ARE SCHOOL FOOD SERVICES NECESSARY?

The 1968-1970 Ten-State Nutrition Survey found school lunch programs *"to be a very important part of the nourishment of many children. Particularly in the low income ratio states, school lunches contributed a substantial proportion of the total nutrient intake of many school children. The contribution of school lunch to overall nutrition was particularly important among black children."*

The 1969 Massachusetts dietary survey of public school children showed that almost three-fourths of the students buying the Type A meal had a satisfactory or good lunch. On the other hand, two-thirds of the children bringing lunch from home, going home for lunch, or buying a la carte items had an inadequate meal. In addition, students buying the Type A lunch had plus values in reaching recommended daily allowances for milk, meat, vegetables, and fruits.

The Massachusetts study also demonstrated the need for breakfast service in all schools. On the survey day, 139,000 children ate no breakfast, and 257,000 students had a substandard meal. These figures represented 37 percent of the total public school enrollment. They indicate that our classrooms may be filled with boys and girls who are not properly nourished to achieve top performance in educational programs.

School food services play a substantital role in advancing the Massachusetts educational goal, *physical and emotional well-being*. Administrators, teachers, and other school personnel must promote and support feeding programs that enhance this goal and strongly oppose school activities that detract from its achievement. This would include the sale of "empty calorie" foods in direct competition with the Type A lunch or during the regular school day.

THE CAFETERIA IS ANOTHER CLASSROOM

The cafeteria is the ideal classroom for the practice of nutrition that will build and maintain health during growing years and establish good eating habits to be followed throughout life. It can be the testing laboratory for nutrition-oriented subjects taught in the classroom; the training laboratory for food service, business, or health-related careers. It is the favorite gathering place for Open Campus (MAX-ED) programs, and as such, can help to set up sound nutritional patterns. The school food service program can provide many opportunities for correlating nutrition education as well as other educational programs in the curricula.

PART TWO
CURRICULUM GUIDE AND COURSE OF STUDY

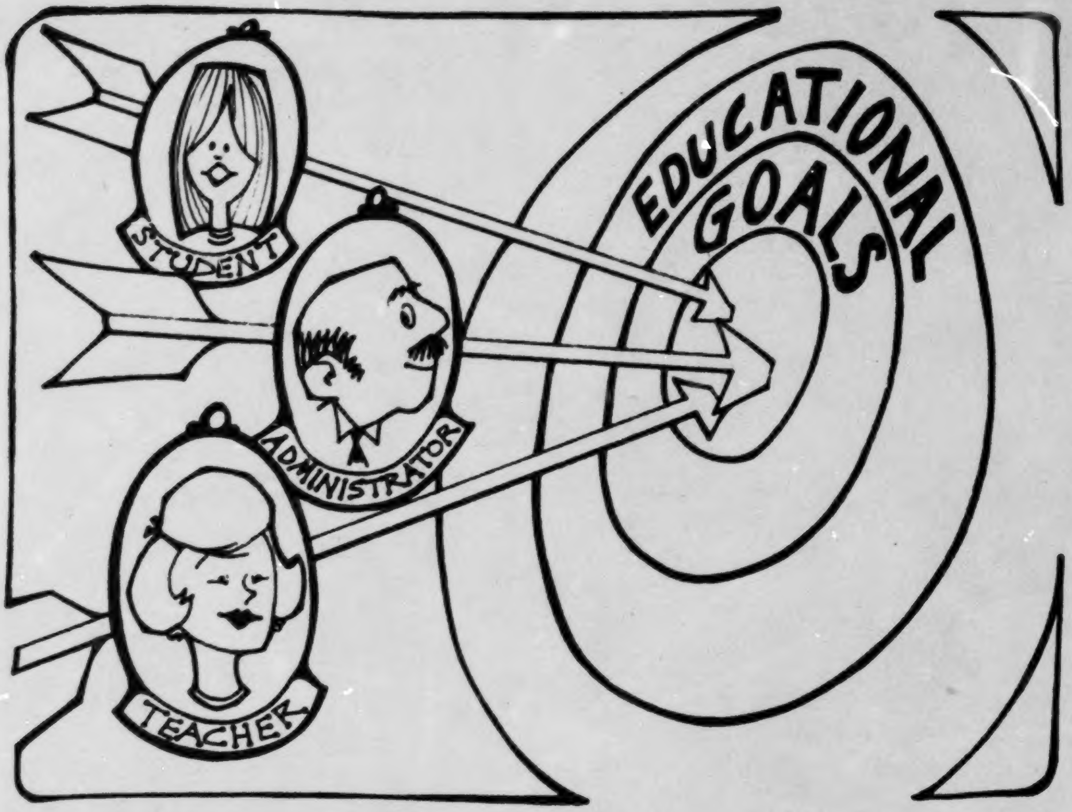
Part Two is a guide for a sequential education program as an integral element in all disciplines of the curriculum for grades seven through twelve. It extends nutrition concepts presented in grades kindergarten through six. Its format and presentation may require modifications to meet the needs, interests, and abilities of each class. Its purpose is to make nutrition education a dynamic and exciting learning experience throughout the school years.

Nutrition Education is universally needed regardless of income, geographic location, cultural, social, or economic patterns, or level of education. There is no instinct that guides man to select those foods which meet the nutritional needs of the body. And knowledge is not inherited. Each new generation must be taught what foods to select and why, and how food affects health.

Dr. E. Neige Todhunter, Visiting Professor of Nutrition
School of Medicine, Vanderbilt University

6

TEN EDUCATIONAL GOALS FOR MASSACHUSETTS



The following ten educational goals prepared by the Massachusetts Department of Education have been adapted for teaching nutrition in the schools.

PHYSICAL AND EMOTIONAL WELL-BEING

> *Education should contribute to the learner's physical and emotional well-being, especially to a sense of personal worth and to a capacity for influencing one's own destiny.*

Without a healthy body and sound mind, advancement toward other educational goals will be more difficult. Nutrition education programs must deal effectively with the abuses and excesses of today's society. The learner must recognize that nutritional well-being is essential throughout life, not only for his own health but also for the health of future generations. The teacher must offer programs which will affect behavioral changes promoting optimum physical and mental health. Schools must provide services that promote and support these behavioral objectives. Families and community agencies must work in partnership with the schools.

BASIC COMMUNICATION SKILLS

Education should develop in each learner the basic skills needed for communication, perception, evaluation, and conceptualization of ideas. Among the most important are reading, writing, speaking, listening, visual, and computational skills.

Nutrition education helps to develop basic communication skills. Through an integrated curricula approach, the teacher can capitalize on the student's natural interest in food. The learner should be able to understand and evaluate the multiplicity of nutrition information available and distinguish between fact and opinion.

EFFECTIVE USES OF KNOWLEDGE

Education should provide for each learner access to man's cultural heritage, stimulate intellectual curiosity, and promote intellectual development.

Nutrition education inspires the learner with the excitement of exploration and discovery and of needs recognized and fulfilled. It gives him the opportunity to understand how the past affects the present and future.

CAPACITY AND DESIRE FOR LIFELONG LEARNING

Education should foster and stimulate in each learner the natural desire for lifelong learning and should develop the skills necessary to fulfill that desire.

Scientific and technical advancements in the field of foods and nutrition will make tomorrow's world vastly different from our own times and experiences. Nutrition education prepares the learner for adapting to the many changes which will occur in the years ahead.

CITIZENSHIP IN A DEMOCRATIC SOCIETY

Education should provide each learner with a knowledge and understanding of how our society functions in theory and in practice; education must also foster individual commitment to exercise the rights and responsibilities of citizenship and to protect the rights of others.

Nutrition education promulgates the right of all citizens to the means for achieving optimum nutritional health throughout life. It acquaints the learner with the political, economical, and social resources available to obtain this objective and encourages active participation in affecting change.

RESPECT FOR THE COMMUNITY OF MAN

Education should provide each learner with knowledge and experience which contribute to an understanding of human similarities and differences and which advance mutual respect for humanity and for the dignity of the individual.

Nutrition education develops a knowledge and appreciation of human diversity in relation to foods and nutrition. It helps the learner to understand his own heritage and culture as well as those who differ from him in sex, race, religion, socioeconomic status, and nationality. It provides laboratories through the food service program for experiencing some cultural differences as they pertain to foods.

OCCUPATIONAL COMPETENCE

Education should provide the learner with the skills, experience and attitudes, and the guidance of initial job placement; it is equally important for the learner to develop a capacity to adapt to changing conditions.

Nutrition education develops a knowledge and understanding of the importance of optimum nutritional well-being throughout life in all occupations. Food service programs provide the clinical experiences necessary for a career in quantity food service, business management, and health-related areas.

UNDERSTANDING OF THE ENVIRONMENT

Education should provide each learner with knowledge and understanding of the social, physical, and biological worlds and the balance between man and his environment and should develop attitudes and behavior leading to intelligent use of the environment.

Nutrition education fosters attitudes in the wise use of food resources on an individual and collective basis. It acquaints the learner with the personal and political recourses available to concerned citizens.

INDIVIDUAL VALUES AND ATTITUDES

> *Education should expand and advance the humane dimensions of all learners, especially by helping them to identify and cultivate their own spiritual, moral, and ethical values and attitudes.*

Nutrition education introduces the learner to the great ideas of the world's culture in the areas of food and nutrition. It promotes civic and social awareness for the need of optimum nutrition for all people.

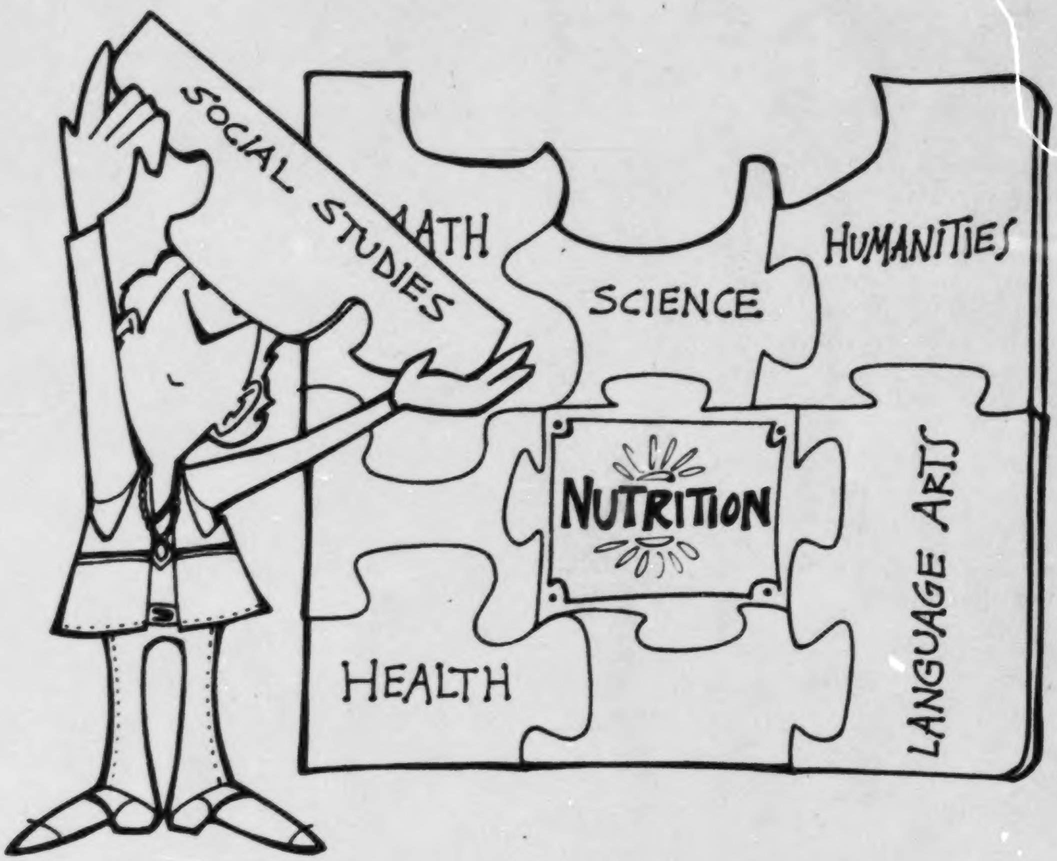
CREATIVE INTERESTS AND TALENTS

> *Education should provide each learner with varied opportunities to nurture interests, to discover and to develop natural talents, and to express values and feelings through various media.*

Nutrition education and food service programs, through an integrated curricula approach, can provide clinical experience for developing the learner's creative talents.

7

AN INTEGRATED APPROACH



Nutrition can be effectively integrated into many curriculum areas. Using this approach, learning experiences are accommodated to individual needs and concerns, and can reach every student.

Nutrition can also be taught as a unit of the health program. The health curriculum, though, may entail as many as twenty subject areas. Therefore, the time alloted for any one aspect is restrictive, and the emphasis may depend upon the teacher's interest and subject knowledge. In addition, at the secondary level, health courses may reach only a limited number of students.

THE NUTRITION EDUCATOR

Ideally, nutrition education should be the responsibility of a qualified person who has an academic background in education, nutrition, and food services. A comprehensive and sequential program should be developed as an integral part of the curriculum of each school in the community. This person should work through the school food service program to correlate feeding efforts with nutrition education.

A nationally-accepted conceptual framework should be used to develop a new curriculum or to assess existing curricula. Two such guides are now available.

- Basic Concepts for Nutrition Education, White House Conference on Food, Nutrition, and Health, 1969.
- Basic Concept of Nutrition for Nutrition Education, Interagency Committee on Nutrition Education, revised 1972.

These guides are very similar, and either would produce acceptable results.

The nutrition educator would work in close cooperation with the school health or other curriculum coordinators, teachers, and nutrition education specialists from the State Department of Education. This person would also prepare resource materials and teacher's aids, and would develop surveys and tests to evaluate nutrition education activities.

BASIC CONCEPTS FOR NUTRITION EDUCATION

The following conceptual framework for nutrition education was developed by the 1969 White House Conference on Food, Nutrition, and Health. We have adapted it as the basis for our teacher's guide.

- Nutrition is the process by which food and other substances eaten become you. The food we eat enables us to live, to grow, to keep healthy and well, and to get energy for work and play.

- Food is made up of certain chemical substances that work together and interact with body chemicals to serve the needs of the body.
    1. Each nutrient has specific uses in the body.
    2. For the healthful individual, the nutrients needed by the body are usually available through food.
    3. Many kinds and combinations of food can lead to a well-balanced diet.
    4. No natural food, by itself, has all the nutrients needed for full growth and health.

- The way a food is handled influences the amounts of nutrients in the food, its safety, appearance, taste, and cost; handling means everything that happens to food while it is being grown, processed, stored, and prepared for eating.

- All persons, throughout life, have need for about the same nutrients, but in varying amounts.
    1. The amounts needed are influenced by age, sex, size, activity, specific conditions of growth, and state of health, altered somewhat by environmental stress.
    2. Suggestions for kinds and needed amounts of nutrients are made by scientists who continually revise the suggestions in the light of the findings of new research.
    3. A daily food guide is helpful in translating the technical information into terms of everyday foods suitable for individuals and families.

- Food use relates to the cultural, social, economic, and psychological aspects of living as well as to the physiological.
    1. Food is culturally defined.
    2. Food selection is an individual act but is usually influenced by social and cultural sanctions.
    3. Food can be chosen so as to fulfill physiological needs and at the same time satisfy social, cultural, and psychological wants.
    4. Attitudes toward food are a culmination of many experiences, past and present.

- The nutrients, singly and in combinations of chemical substances simulating natural foods, are available in the market; these may vary widely in usefulness, safety of use, and economy.

- Foods play an important role in the physical and psychological health of a society or nation just as it does for the individual and the family.
    1. The maintenance of good nutrition for the larger units of society involves many matters of public concern.
    2. Nutrition knowledge and social consciousness enable citizens to participate intelligently in the adoption of public policy affecting the nutrition of people around the world.

BEHAVIORAL OBJECTIVES

The suggested curriculum has not been written in behavioral terms as this guide must be adapted to the needs of 351 cities and towns as well as regional school districts. Instead, broad Goal Statements with Generalizations to implement basic concepts have been established. Explicit objectives in measurable terms should be developed in the communities so that both the teachers and students have a blueprint for action.

Learning experiences have been developed which the teacher or coordinator may include in their objectives or learning packages. Behavioral objectives are more effective when constructed for a specific situation in a class, school, or community. A pre-test and post-test should be a part of each learning experience. A list of resources has been provided to implement learning experiences.

SAMPLE BEHAVIORAL OBJECTIVE

A sample series of objectives is provided here, based upon the following guidelines that *terminal* objectives include:

- The subject or *doer* of the activity.
- The behavioral task or activity, and the product of that task.
- The conditions or circumstances under which the learner is to perform the task.
- The standards or criterion as the *minimum* level of acceptance for completion of the task.

Intermediate performance objectives only require the first two components. Variations of the same objective have been constructed to illustrate simple sequencing of a basic concept and to utilize higher levels of learning.

Generalization: *Nutrients can be obtained from foods. Drugs are used only when prescribed by a physician.*

Learning Experience: *Research dangers of excessive intakes of fat-soluble vitamins and iron.*

Behavioral Objectives:

1. The learner will write the definition of the term "fat-soluble vitamin." (memory)
2. Given a list of nutrients, the learner will select the fat-soluble vitamins. (comprehension)
3. After reading Pages 81 - 85 in Deutsch's *Family Guide To Better Food and Better Health*, the student will identify the functions and storage of fat-soluble vitamins. (analysis)
4. Given a series of articles and the pamphlet, *Vitamin Supplements*, the learner will assess the accuracy of claims about the advantages of supplements of two fat-soluble vitamins and iron. This report must include one outside resource. (evaluation)

LEARNING LEVELS

The student should be exposed to different levels of learning, including *knowledge, comprehension, application*, and *problem solving* (the highest level). This variety will enable the learner to utilize his knowledge or memory skills as a foundation to more realistic application and problem solving levels encountered in daily living.

LEARNING DOMAINS

The three fundamental learning domains are interdependent. No behavioral objective can be purely *psychomotor, cognitive*, or *affective*. Again, these domains reflect a variation in complexity. Psychomotor skills require more manipulative activities such as those acquired by cooking in the school cafeteria. Cognitive domain involves more intellectual or thinking processes such as applying nutrient needs to planning home or school menus. The affective domain is difficult to measure because it refers to values and attitudes — an actual change in food habits, for example. However, a cognitive activity may represent the student's attitude toward a certain concept. The intangible aspects of affective objectives and goals are better suited for the final outcome of a program or course, which we hope would be a change in behavior or attitude.

In nutrition education, the student should be willing to value his or her health and well-being by practicing wise eating habits.

MASSACHUSETTS EXPANDED EDUCATION (MAX-ED) PROGRAMS

Massachusetts Expanded Education Programs (Open Campus) have two major objectives.

- Encouraging schools to use community resources in educational programs.
- Encouraging students to assume greater responsibility for their own educational and social development.

These programs can help students make productive use of unscheduled time; increase awareness of the needs of people and their own needs; promote understanding between students and teachers; and improve communications between schools and communities.

Nutrition education can contribute to both off-campus and on-campus options. Students can volunteer services to promote governmental feeding programs such as helping in child care centers, elderly feeding programs, or in needy family distribution centers. Students can act as "nutrition teachers" for lower grades or in Head Start programs. They can establish advisory councils for food service programs or nutrition councils to help with food-related health problems. Mini courses can be offered in various aspects of nutrition or food service. The school cafeteria can be used as a training center for future chefs or for dietary aides or to practice business management procedures. Surveys or studies can be made concerning legislation affecting nutrition or food service.

Community people who can assist with MAX-ED programs include food service and nutrition education specialists from the State Department of Education, public health personnel, legislators, doctors, nurses, dentists, food service managers, dietitians, representatives from food industries.

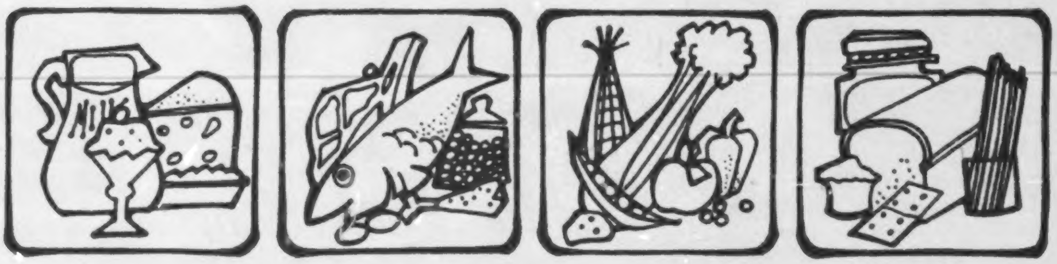
By becoming involved in MAX-ED programs relating to nutrition, students can actively participate in individual and community affairs affecting the nutritional health of a society or nation.

8

A TEACHER'S GUIDE

Grades Seven, Eight, Nine

Basic Concept: FOOD PLAYS AN IMPORTANT ROLE THROUGHOUT LIFE



Goal Statement	*Generalizations*
- Individuals vary in their rate of physical development.	"Average" physical development includes a variety of body structures.

Learning Experiences

- Discuss food supply in relationship to development of man. Compare various societies and times.
- Compare physical size of other societies or times to people in the United States today. Visit a museum or historical site and note sizes of furniture, clothes, armor, mummies.
- Chart stages of human development and outline determining factors.
- Write a self-descriptive essay emphasizing physical characteristics.
- Sketch various body types to illustrate differences in physical development.
- Chart height and weight measurements of class members using standard growth percentiles.
- Compare and discuss growth rates of various animals.

Resources

Books

America Before Columbus

Biological Science

The Developing Child

Everyday Life on the American Frontier

The First Comers

Food for People

Home Life in Colonial Days

Indian America

Introduction to Nutrition

Life in Colonial America

Life in the Middle Ages

Life in Roman Britain

The Pageant of South American History

Picture Book of the Continental Soldier, Revolution and the Confederation

The Science of Man

The Thirties

Field Trips

Mystic Seaport

Plimoth Plantation

Sturbridge Village

Pamphlets

A Boy and His Physique

Goal Statement	*Generalizations*
	Heredity contributes to the determination of physical size.
	The amounts and kinds of food eaten are determinants of growth.

Learning Experiences	*Resources*
	A Girl and Her Figure Posters *See How They Grow* Resource People School nurse School psychologist
• Present a biographical or historical skit on genetic contributions made by Mendel, Burbank, Carver, and Johannsen. • Construct a bulletin board of class "baby faces" illustrating different hereditary factors. • Write descriptive essay comparing your physical characteristics with parents or other family members. • Interview local animal breeders to determine role of heredity in animal husbandry.	Books *Biographies* of Burbank, Carver, Johannsen, and Mendel Field Trips Area Agricultural Station Resource People Animal Health Agent County Extension Service Agent Zoo curator
• Research and report on socio-economic conditions influencing health and nutrition of urban families, migrant workers, tenant farmers, and the American Indian. • Using a TV panel approach, report on areas of the world where limited land and food supply have affected the development of its people. Analyze efforts to improve these conditions; predict results; and propose alternate solutions.	Agencies Corn Products Corporation Ford Foundation International Red Cross Massachusetts Department of Education Department of Public Health

Goal Statement	*Generalizations*

Learning Experiences

- Develop "picture equations" of nutrients needed for development of strong bones, teeth, and muscles; healthy eyes and skin.
- Prepare lesson to teach to lower grade students such as writing a simple, illustrated story imagining that student is a hamburger or a glass of milk. In story, trace journey from food to body function.
- Analyze nutrient content of Type A lunch. Compare with nutrients in a lunch of iced cupcake and soft drink.
- Using diagram of digestive tract, label where each food from a Type A lunch is digested and absorbed.
- Construct bar graphs comparing protein, calcium, and caloric content of foods used as snacks such as: 1 oz. cream cheese to 1 oz. cheddar cheese; ½ cup ice cream to 2 oz. chocolate bar.
- Conduct animal experiment using school breakfast or Type A lunch. Use project as teaching unit for lower grades.

Resources

Rockefeller Foundation

United Nations

  Pan American Health Organization (PAHO)

  UNESCO - UNICEF

  World Health Organization (WHO)

United States

  Agency for International Development (AID)

  Bureau of Indian Affairs

  Food for Peace

  Peace Corps

  Vista

Articles

  Country Blues

Books

  The American Poor

  The Family Guide to Better Food and Better Health

  Food and Life

  Food and Man

  The Forgotten Minority

  Hunger U.S.A.

  Hunger U.S.A. Revisited

  Indian America

  Modern Biology

Goal Statement	***Generalizations***

Learning Experiences	*Resources*
	Race Against Famine
	This Crowded Planet
	World Food
	Films
	Food for a Modern World
	How a Hamburger Turns into You
	Filmstrips
	How Food Becomes You
	Handbooks
	Composition of Foods, Agricultural Handbook No. 8
	Food Values of Portions Commonly Used
	Nutritive Value of Foods, Home and Garden Bulletin No. 72
	Kits
	Comparison Cards for Teens
	Food Models
	Rat Experiment
	Pamphlets
	Eat to Live
	Food, A Key to Better Health
	How Your Body Uses Food

Goal Statement	*Generalizations*
- Each stage of physical development requires the same nutrients but in varying amounts. The amounts of nutrients needed are influenced by age, sex, size, and activity.	Young children, particularly infants and adolescents, represent periods of rapid growth with special needs for nutrients.

Learning Experiences	*Resources*
	Hunger in America *Hunger in Chicago* Posters *Type A for a Better Day* Resource People School food service supervisor
• Trace and discuss a child's nutritional needs from birth to six years. List foods and nutrients most essential during these stages. • Visit child care center. Participate in mealtime activities. Share observations with class, suggesting how eating habits could be improved. • Explain the effects of malnutrition on children in war-torn or developing countries. Emphasize relationship of mental retardation in the very young. • Compare the environmental influences on children and teens today with those of Middle Ages, Colonial America, Victorian Era, or other historical periods. • Observe and record eating habits of younger family members or babysitting charges. Plan "ways and means" to improve food intake. • Compose a simple song to describe how young children grow. Use for teaching in lower grades. • Correlate stages of human growth with animal or plant life. Include similarities and differences of needs.	Agencies International Red Cross Massachusetts Department of Education Department of Public Health United Nations Food and Agriculture Organization (FAO) UNESCO Books *Biological Science* *The Developing Child* *The Family Guide to Better Food and Better Health* *Food and Man* *Nutrition for the Growing Years* *Nutrition, Science and You* *People, Food, and Science*

Goal Statement	*Generalizations*
	Adult nutrient requirement is essentially for maintenance and repair of body tissue. Caloric needs are reduced.

Learning Experiences	*Resources*
	See page 41 for additional historical references. Field Trips Day care center Head Start program Pamphlets *Child Feeding Programs* *Food Before Six* *Head Start Programs* *Lives in Peril* Resource People Pediatrician School nurse
• Discuss physical diagram of adult human body. Describe how illness, disease, injury, or surgery may affect body systems. Show how nutrient requirements would be changed. • Compare how caloric and nutrient needs may vary depending upon sex, activity, size, and climatic conditions (i.e. men and women, lumberjack and accountant, homemaker and secretary). • Trace activities determining adult caloric needs for different periods in history.	Books *Biological Science* *Cooper's Nutrition in Health and Disease* *The Family Guide to Better Food and Better Health* *Food and Man* *Foods, Diet and Nutrition* *Nutrition in Action* *Nutrition and Diet Modifications for the Nurse* *Nutrition for the Growing Years*

Goal Statement	*Generalizations*
	Recommended dietary allowances (RDA) for kinds and amounts of nutrients needed are determined by scientists. These suggestions are constantly revised as a result of the findings of new research. The U.S. Food and Drug Administration established minimum daily requirements (MDR) and U.S. recommended allowances (U.S. RDA).

Learning Experiences	*Resources*
	Pamphlets *A Boy and His Physique* *A Girl and Her Figure* *A Girl, Her Figure, and You* Resource People Physician School nurse Therapeutic dietitian
• Compare RDA to MDR and U.S.RDA. • Investigate the origins of RDA and reasons for periodic changes. • Evaluate nutritional information on food labels. Relate to RDA and MDR or U.S.RDA. • Calculate nutritional content for one meal using RDA for individual or group, age, and sex. Compare with analysis of Type A lunch. • Examine 24-hour dietary recall for nutritional adequacy using RDA and Basic Four. • Analyze school lunch menus for ⅓ of RDA for all nutrients. • Plan food budgets at different income levels meeting RDA requirements. Show that a nutritionally adequate meal is possible at low income levels. • Compare United States RDA with those established for other countries. Consider reasons for differences.	Agencies Massachusetts Consumers Council Food and Drugs Division National Academy of Sciences, National Research Council United Nations Food and Agriculture Organization (FAO) United States Department of Agriculture Food and Drug Administration Articles *Facts You Should Know About Food Labels* *Nutritional Labeling*

Goal Statement	*Generalizations*

Learning Experiences	*Resources*
	Nutrition Labels Speeded by FDA *You Can Help Speed New Look in Labels* Books *Foods* *Foods, Diet and Nutrition* *Fundamentals of Normal Nutrition* *Human Nutrition and Dietetics* Handbooks *Composition of Foods, Agricultural Handbook No. 8* *Food Values of Portions Commonly Used* *Nutritive Value of Foods, Home and Garden Bulletin No. 72* Pamphlets *Can We Eat for Less?* *Family Economic Review* *Recommended Dietary Allowances* *Your Money's Worth in Foods, Home and Garden Bulletin No. 183* Posters *A Guide to Good Eating* *Daily Food Guide* Resource People School food service supervisor

Goal Statement	*Generalizations*
• The nutrients needed by the body are usually available through food.	Eating a wide variety of foods is essential. No one natural food supplies all the nutrients needed for growth and health.

Learning Experiences

- Investigate foods available in other countries which will supply a balanced diet. Visit markets; have international tasting parties.
- Write and illustrate a children's story showing the fun of and need for eating a variety of foods. Use for teaching lower grades.
- Compose "fun" food poems (especially about fruits and vegetables) using *onomatopoeia* and *alliteration*. Use with lower grades.
- Construct posters and displays to be used during School Lunch and Child Nutrition Weeks stressing the need for eating a wide variety of foods.

Resources

Agencies

- American and Massachusetts School Food Service Associations
- Massachusetts Department of Education
- Ministries of Agriculture or Food
- U.S. Department of Agriculture

Books

- *The Cookbook of the United Nations*
- *Food and Man*
- *Nutrition and Diet Modifications for the Nurse*
- *People, Food, and Science*

Field Trips

- Local market of a particular ethnic group

Films

- *The Big Dinner Table*
- *Food for Southeast Asia*
- *Rice*

Pamphlets

- *Eat to Live*

Periodicals

- Foreign language magazine

Goal Statement	***Generalizations***
	Many kinds and combinations of foods can lead to a well-balanced diet. Each of the four basic food groups provides some of the essential nutrients.

Learning Experiences	*Resources*
	Posters *A Guide to Good Eating* *Daily Food Guide* *Type A for a Better Day* Resource People Exchange student or family Grandparents Local ethnic representative (i.e. French, Italian, Puerto Rican, Polish) School food service supervisor
• Survey a local market. Record costs of foods from each of the Basic Four food groups, including low, moderate, and high cost items. Evaluate nutritional effect on limited income families. • Conduct a tasting session of protein analogs or other fabricated foods for students, faculty, and administration. Use as a teaching unit for lower grades. • Prepare a one-day family meal plan which includes government donated foods. Compare cost of same menu using all purchased foods. • Develop and construct a puzzle or game showing the Basic Four and use with lower grades.	Agencies General Foods Massachusetts Bureau of Labor Department of Public Welfare Ministries of Agriculture Nabisco — Astra NASA — National Aeronautics and Space Administration U.S. Department of Agriculture Books *Nutrition for the Growing Years*

Goal Statement	*Generalizations*
	Nutrients can be obtained from foods. Drugs are used only when prescribed by a physician.

Learning Experiences	*Resources*
	Field Trips Corner grocery store Local supermarket National chain store Kits *Food Makes the Difference* Pamphlets *Family Economic Review* *Your Money's Worth in Foods, Home and Garden Bulletin No. 183* Posters *A Guide to Good Eating* *Daily Food Guide* Resource People County Extension Service Agent or Aides School food service supervisor
• Research dangers of excessive intakes of fat-soluble vitamins and iron. • Debate the vitamin C and E controversies or other current nutrient issues. • Evaluate the possibility of excessive nutrient intake through the use of fortified and engineered foods. • Describe conditions when nutrient supplementation might be prescribed by a physician.	Agencies County Extension Service Massachusetts Department of Public Health Articles *How to Guarantee Yourself the Vitamins You Need* *Iron Enrichment Controversy*

Goal Statement	Generalizations

Learning Experiences

Resources

Linus Pauling and the Common C

Massive Dose Vitamins, the Newest Craze

Perspective on Vitamin E

Vitamin C Study Rebuts Pauling

The Vitamin E Boom: Four Experts Sift Facts from Fantasy

Vitamin E, the Latest Vitality Fad

Vitamin E, New Fad

Vitamin E, a Review

Warning on Vitamins; Massive Doses of Any Kind Unsafe

Books

Cooper's Nutrition in Health and Disease

The Family Guide to Better Food and Better Health

Foods, Diet and Nutrition

Introduction to Nutrition

Practical Nutrition

Vitamin C and the Common Cold

Pamphlets

Your Age and Your Diet

Vitamin Supplements

Goal Statement	*Generalizations*
• The way food is handled influences the amount of nutrients present; its safety, appearance, and taste.	The amount of food available in this country is a result of scientific farming methods.

Learning Experiences	*Resources*
	Resource People Food Technologist Nutritionist Physician
• Debate the use of organic versus chemical fertilizers; use of pesticides. Record growth, size, yield, and taste of vegetables grown organically and chemically, with and without pesticides. • Chart development of farm machinery. Cite historical events leading to their invention and resulting product changes. • Describe effects of Industrial Revolution on food habits and health of the people. • Compare farming methods and geography of countries. Relate these conditions to kinds and amounts of food produced, and to the health of the people. • Discuss the importance of transportation and distribution to food supply. • Using the theory of "Guns and Butter," or other food item, summarize effects of food surplus and demands. • Compose a science fiction story imagining that farms disappeared. Depict what would happen in a week to life in the United States.	Agencies American Dairy Association American Sound Transportation Review Organization CARE County Extension Service Grocery Manufacturers of America Peace Corps Rockefeller Foundation United States Agency for International Development (AID) Department of Agriculture Articles *The Fertilizer Fight* *Going Organic* *Health, Organic, and Natural Foods* *Organic Food — How Much Nutrition and How Much Hoax* *The Organic Food Kick*

Goal Statement	*Generalizations*

Learning Experiences	*Resources*
	The Organic Fraud
	What About the Organic Way?
	Books
	Agriculture U.S.A.
	Economics
	The Farmer
	Farms and Farmers in Art
	The Foodbook
	The French Revolution
	The Great Nutrition Puzzle
	The Pageant of South American History
	The Soviet Union, Fifty Years
	Yearbooks of Agriculture
	Contours of Change, 1970
	Food, 1959
	Food for Us All, 1969
	A Good Life for More People, 1971
	Power to Produce, 1960
	Protecting Our Food, 1966
	Films
	Economic Geography, Comparing Two Nations
	Food for a Modern World

Goal Statement	*Generalizations*
	The variety of foods available in the country is partly due to methods of preservation.

Learning Experiences	*Resources*
	Food from the Desert *Food of Southeast Asia* *House of Man, Part II (Our Crowded Environment)* *Man and the Land* Resource People *County Extension Agricultural Agent* *Food retailer and wholesaler* *Foreign exchange student or family* *Legislator* *Peace Corps volunteer* *Teamster representative*
• Outline and discuss principles of food preservation. Describe food properties that have been changed and chemicals added to retard or prevent spoilage. Experiment with some simple or "primitive" methods of preservation such as salting, canning, chemical additives. • Research food preservation and marketing practices in developing countries. Relate these methods to nutritional and economic status. • Explain and substantiate how food preservation aids in checking waste. • Discuss need for food preservation in maintaining good marketing practices. • Research and discuss historical significance of food preservation, emphasizing the importance of war in generating food technology (i.e. canning, Napoleon; evaporated milk, Civil War; freeze-drying, combat and astronauts).	Agencies Arthur D. Little Company Peace Corps United States Agency for International Development (AID) Army Food and Drug Administration Articles *The Business of Agribusiness*

Goal Statement	*Generalizations*

Learning Experiences

- Chart increase in food availability with each new preservation method. Correlate with any significant changes in health or life expectancy.
- Visit a plant or laboratory experimenting with new preservation methods. Predict their effect on future generations.
- Chart and compare nutritive values of canned, fresh, and frozen foods. Discuss other considerations to be made when using these foods (i.e. cost, storage, cooking facilities).
- Taste-test commercially dried food samples with those from a Health Food Store. Compare costs and nutritive values.
- Delineate ways in which the food industry would be different without methods of preservation.

Resources

Foreign Economic Developments and U.S. Agricultural Policy

New Roads and More Eggs, War on Hunger

The Technical Agent, Marketing Problems

Books

Agriculture U.S.A.

Biological Science

Canned Foods in Human Nutrition

The Chemicals We Eat

Conservation

Food and Man

Foods

Fresh, Canned and Frozen

The Great Nutrition Puzzle

How Do They Make It

Oranges

White House Conference on Food, Nutrition and Health, Final Report

Yearbooks of Agriculture

Power to Produce, 1960

Protecting Our Food, 1966

Field Trips

Food processing plant

Goal Statement	*Generalizations*
	Food processing must occur under sanitary conditions for the product to be safe to eat.

Learning Experiences	*Resources*
	Health Food Store U.S. Army Laboratories, Natick Films *Economic Geography* *Food for a Modern World* Handbooks *Composition of Foods, Agricultural Handbook No. 8* *Food Values of Portions Commonly Used* *Nutritive Value of Food, Home and Garden Bulletin No. 72* Pamphlets *The Story of Food Preservation* Resource People Grandparents School food service supervisor Wholesale or retail market manager
• Debate pros and cons of food processing using current consumer claims as the focal point. • Discuss the discovery and application of pasteurization and how it advanced the role of microbiology and bacteriology in food processing. Report on other scientific discoveries which followed Pasteur's work.	Agencies Massachusetts Department of Public Health United States Department of Agriculture Federal Trade Commission Food and Drug Administration

Goal Statement	*Generalizations*
	Food must be prepared and stored properly to retain its nutrients, make it appetizing, and keep it safe.

Learning Experiences	*Resources*
• Visit a meat or milk processing facility. Note laboratory and plant procedures for inspecting products. • Research and discuss the Government's responsibility in food processing. Report on other public or private agencies which may improve consumer interests. • Visit or write to state and federal agencies to learn about food inspection procedures in your locality. • Report on significance of pasteurization in food production and processing, including other foods in addition to milk.	Books *Biological Science* *Consumer Economics* *Cooper's Nutrition in Health and Disease* *The Family Guide to Better Food and Better Health* *Modern Biology* *Practical Nutrition* Field Trips Food, meat, and milk processing plant Offices of Food and Drug Administration or U.S. Department of Agriculture Miscellaneous *Federal Register* *U.S. Congressional Record* Resource People Food Technologist Inspector for Food and Drug Administration or U.S. Department of Agriculture
• In a cartoon or children's story, describe how sanitation affects the safety of food eaten (i.e. how temperature influences microbe growth). Use with lower grades. • Discuss and diagram principles of refrigeration and freezing. Explain why food wilts, molds, or loses flavor.	Agencies National Sanitation Foundation Books *Foods in Homemaking*

Goal Statement	*Generalizations*
	Food additives are intentional or accidental. Intentional additives enhance the nutritional benefits or add to the flavor, appearance, or keeping qualities. Accidental additives lead to spoilage or toxic conditions.

Learning Experiences	*Resources*
• Visit a food processing plant (TV dinners or prepackaged meals) to observe sanitary practices. Explain purposes of test kitchens or food technologists. • Visit the school cafeteria to observe sanitary practices in food storage, preparation, serving, and in cleaning procedures. • Correlate food preparation method with nutrient retention, taste, and appearance. Consider fat and water soluble properties, oxidation, chemical additives.	*Modern Biology* *People, Food, and Science* *Sanitary Techniques in Food Service* Field Trip Food processing plant School cafeteria Pamphlet *Bacteria, the Littlest Cell* Resource People *Food Technologist* *Industrial arts instructor* *Refrigerator dealer or repairman* *School food service supervisor*
• Research periodicals and newspapers for consumer reports on food additives. Debate these findings from the viewpoints of industry, science, and the consumer. • Invite representative from food processing facility to explain uses and regulations for additives. • Taste-test foods prepared with and without additives such as MSG (monosodium glutamate), meat tenderizer, food coloring, or flavoring. Suggest "natural" ingredients which could be used as flavor or color enhancers.	Agencies Food and Drug Administration Massachusetts Consumers Council Articles *Fact Sheets from FDA* *Food Additives* *Modern Foods Safer Than Old Natural Types* Books *The Chemicals We Eat*

Goal Statement	*Generalizations*
	The U.S. Department of Agriculture (USDA) helps to insure a safe food supply. The Food and Drug Administration (FDA) was established to protect all citizens.

Learning Experiences	*Resources*
• Report on additives which have been removed from the market or are being investigated. • Collect food labels listing chemical additives. Research reasons for use. Compare chemical properties and results expected from their use. • Research "accidental" additives leading to food poisoning. Relate to family and quantity food service.	*Cooper's Nutrition in Health and Disease* *The Family Guide to Better Food and Better Health* *Foods* *Poisons in Our Food* *Practical Nutrition* Handbooks *Food Values of Foods Commonly Used* Pamphlets *Additives in Our Foods* *Food Additives, Everyday Facts* *Food Additives, What They Are and How They Are Used* Resource People Food processing representative Public Health sanitation inspector School food service supervisor
• Outline historically the establishment of the Food and Drug Administration. Define its original purpose and how its effect has been sustained. Describe nation's attitude during period of Food and Drug Administration development. • Explain how the Better Business Bureau or Consumer Council assists the Food and Drug Administration and U.S. Department of Agriculture in protecting the consumer.	Agencies Better Business Bureau Consumer Marketing Service Massachusetts Consumers Council United Nations, Food and Agriculture Organization (FAO)

Goal Statement	*Generalizations*

Learning Experiences

- Research and report on the cooperative efforts of the U.S. Department of Agriculture with other agencies. Define inspection stamps used by U.S. Department of Agriculture. Relate these standards to wise consumer practices.
- Compare the responsibilities of Food and Drug Administration with similar bureaus in other countries (jurisdiction, administration, and effectiveness).
- Collect and report on current news items pertinent to consumer interest and Food and Drug Administration or U.S. Department of Agriculture.

Resources

United States

Department of Agriculture

Department of Health, Education and Welfare

Food and Drug Administration

Books

Consumer Economics

Cooper's Nutrition in Health and Disease

The Family Guide to Better Food and Better Health

Food, Diet and Nutrition

Foods

Fruitcake and Arsenic

Practical Nutrition

The Protectors

Yearbook of Agriculture, Protecting Our Food

Kits

Consumer Protection, Foods

Pamphlets

Consumer Product Information

Resource People

Representatives from agencies

Goal Statement	*Generalizations*
	State departments have established codes and standards for food service facilities and water supplies.
	Local agencies implement and amplify state and federal laws relating to foods.

Learning Experiences	*Resources*
• Research water supply for your locality. Discuss frequency and purpose for analyzing water samples. Discover what tests are used. Debate fluoridation of water supplies. • Prepare culture samples of "pure" and "contaminated" water. • Observe eating establishments. As the owner, what improvements should be made; as an inspector, what infractions should be corrected. • Correspond with other states to compare standards and codes relating to food service facilities. • Visit State Department of Public Health for information concerning food standards. • Visit State House or contact your state legislator for legislative material or mandates regulating food service.	Agencies Massachusetts Department of Education Department of Public Health Books *Biology and Human Progress* Kits *Fluoridation Facts* *About Fluoridation* *Fluoridation Handbook for Massachusetts Communities* *It Takes More than an Apple a Day* (poster) *What's the Real Story About Fluoridation?* Resource People Food service director Public Health nutritionist School food service supervisor State legislator
• Invite school food service supervisor to explain standards for wholesome food service within the schools. Cooperate with a teaching unit for cafeteria employees using petri dish cultures to illustrate hand washing techniques and safe dishwashing practices.	Agencies Massachusetts Department of Education Department of Public Health

Goal Statement	*Generalizations*

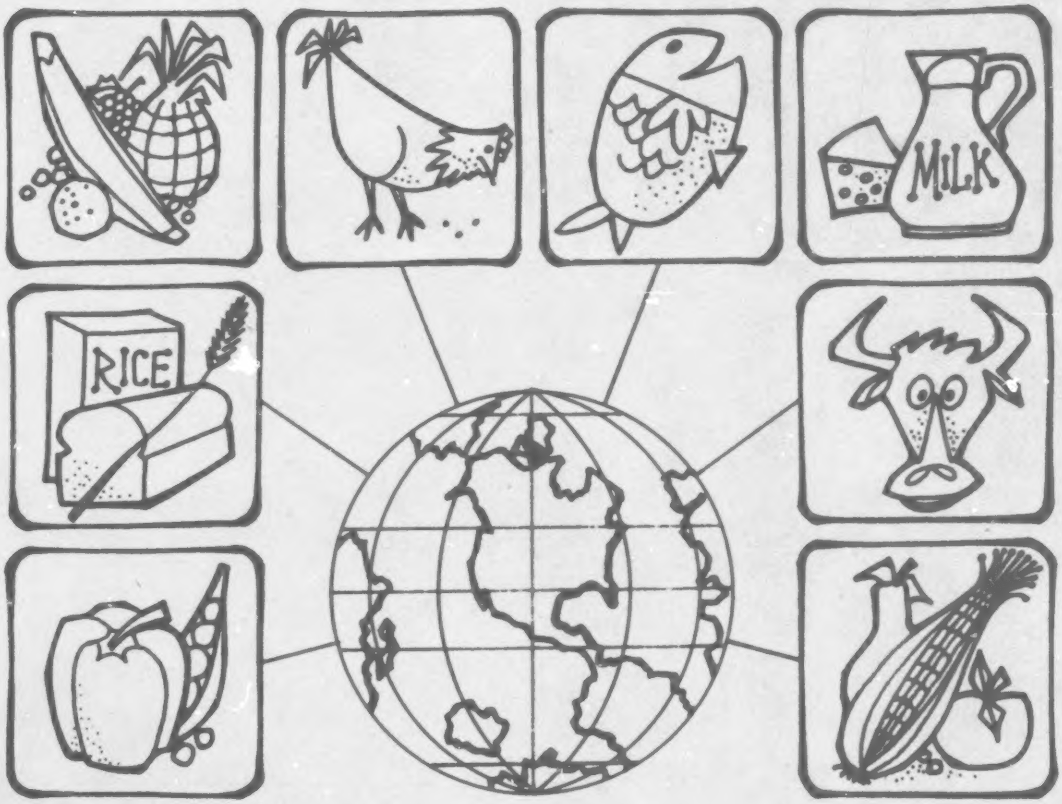
Learning Experiences	*Resources*
- Write serialized articles for school and local paper concerning regulations of school food service programs relating them to meal pattern, nutritional benefits, use of donated foods, cost of meal. - Relate federal and state ordinances to local laws for food and water supplies.	United States Department of Agriculture Department of Health, Education, and Welfare Books *If We Had Ham, We Could Have Ham and Eggs, If We Had Eggs* *Let Them Eat Promises* *The School Lunch* *The School Lunchroom* Pamphlets *The National School Lunch Program, FNS 63* Resource People Department of Education nutritionist School food service supervisor School superintendent Town administrator

9

A TEACHER'S GUIDE

Grades Ten, Eleven, Twelve

Basic Concept: FOOD INFLUENCES ALL AREAS OF WORLD SOCIETY



Goal Statement	*Generalizations*
• Food is made up of different nutrients needed for growth and health.	In metabolism, food is broken down into nutrients which are used for growth and repair, regulatory processes, and energy. Nutrients work together and interact to best serve the needs of the body.
	Errors in metabolism can hinder the absorption of nutrients in the body.

Learning Experiences	*Resources*
• Trace the digestion of a food such as macaroni and cheese. Record where each nutrient is absorbed, utilized, or excreted from the body. • Discuss the "staying power" of various foods or meals in relation to the carbohydrate, protein, and fat content. Conduct class experiment comparing a juice and coffee breakfast to a full meal such as juice, egg and bacon, buttered toast, and milk. • Compare digestive rates of foods. Relate to quick energy foods for athletes, or low satiety factor of high carbohydrate, low protein-fat meals. • Correlate caloric intake with energy output. Calculate calories in a 24-hour dietary recall. Record every physical motion for the same day. Compare intake to needs. • Categorize sample menus of different ethnic groups for major nutrient sources.	Books *China, The Hungry Dragon* *Eating and Cooking Around the World* *Introduction to Nutrition* Kits *Comparison Cards* Pamphlets *A Boy and His Physique* *A Girl and Her Figure* *Weight Control Source Book* *The Wonder of You* Posters *A Guide to Good Eating* *Daily Food Guide*
• Report on inborn errors of metabolism such as diabetes, PKU (phenylketonuria), or celiac disease. • Discuss lactose intolerance in world population. Demonstrate how calcium needs can be met. • Plan a day's menu for a person allergic to foods such as milk, wheat, or egg. Correlate with necessity for reading labels on processed foods.	Books *Cooper's Nutrition in Health and Disease* *Healthful Living — A Textbook of Personal and Community Health* *Human Nutrition and Dietetics* *Nutrition and Diet Modifications for the Nurse* *Nutrition and Diet Therapy*

Goal Statement	*Generalizations*
• All human beings need the same nutrients but in varying amounts according to age, size, activity, and health.	Dietary inadequacies can lead to physical and mental defects. Malnutrition, particularly in the very young, can cause mental retardation.

Learning Experiences	*Resources*
• Survey dietetic section of local market. Evaluate suitability of product for the recommended dietary use. Compare costs to standard food items. • Invite a registered dietitian to be a guest lecturer. • Invite physician, psychologist, registered dietitian, and school nurse for panel discussion of physical and emotional effects of dietary restriction on individual and family members. • Prepare special diets for class tasting such as low sodium, bland, or low residue diets.	Field Trips Local supermarket Nutrition clinic Resource People Physician Psychologist Registered dietitian School nurse
• Explain the effects of malnutrition on children in developing countries. Emphasize possibility of mental retardation in the very young. • Relate periods of famine to population migration; war; and demography. Write a narrative describing family development and life during these crucial periods. • Research and report relationship between malnutrition and learning. Project implications on economic growth of country. • Debate the state's right to legislate health protective measures such as infant testing for PKU (phenylketonuria), enrichment of flour, or fluoridation of water.	Articles *Child Malnutrition and Its Implications for Schools* *Facts and Fallacies About Nutrition and Learning* *How Nutrition Affects Learning and Behavior* *Malnutrition and Social Implications* *Nutrition and Learning* Books *Attack on Starvation* *Cooper's Nutrition in Health and Disease* *The Ecology of Malnutrition in the Far and Near East* *Famine on the Wind* *Food and Civilization* *Food and Man*

Goal Statement	*Generalizations*
	Teen years are a period of rapid growth and body changes, with special needs for nutrients.

Learning Experiences	*Resources*
	Malnutrition, Learning, and Behavior *Primary Child Nutrition, Primary Deterrent to Human Progress* *White House Conference on Food, Nutrition and Health — Final Report* Pamphlets *Lives in Peril* *Malnutrition and Learning* *Nutrition and Intellectual Growth in Children* Posters *Prenatal Nutrition*
• Compare recommended dietary allowances (RDA) for protein, iron, and calcium for ages 8-10, 10-12, 12-14, and 14-18. Discuss reasons for recommended amounts. Ascertain food needs to meet recommendations. • Compare growth and health statistics to food supply and eating patterns of the United States and other countries. • Evaluate effect of war on food supply and growth records. • Compare Japanese growth patterns pre and post World War II. • Investigate reasons for and functions of UNICEF (United Nations International Children's Fund) and YWA (Young World Appeal).	Agencies *United Nations, UNICEF* Books *Cooper's Nutrition in Health and Disease* *Famine on the Wind* *Healthful Living — A Textbook of Personal and Community Health* *Human Nutrition, Historic and Scientific* *The Teen-ager's Guide to Diet and Health* Pamphlets *Lives in Peril* *Nutrition Source Book*

Goal Statement	*Generalizations*
	Overnutrition is a form of malnutrition. Reduction diets should reflect sound nutritional habits.

Learning Experiences	*Resources*
	Recommended Dietary Allowances *A Source Book on Food Practices*
• Calculate caloric content of a day's food intake using amounts recommended by the Basic Four guide. Modify for varying intakes from 1000 to 3000 calories. • Compare caloric content to nutrient value of dessert and snack items. Prepare low caloric items for class tasting. • Establish a WHY WEIGHT group or conduct a mini course on weight control. • Survey and evaluate reducing diets such as the Drinking Man's Diet, Air Force Diet, Banana and Milk Diet. Relate to scientific reliability, health dangers, effectiveness, and costs.	Agencies Massachusetts Department of Education Department of Public Health New England Dairy and Food Council Books *The Family Guide to Better Food and Better Health* *Food Facts for Young People* *Food and Your Future* *Nutrition and Diet Therapy* *The Teen-ager's Guide to Diet and Health* Kits *Comparison Cards* Pamphlets *A Boy and His Physique* *Food Choices: The Teen-age Girl* *A Girl and Her Figure* *Nutrition for Athletes* *Obesity* *Weight Control Source Book*

Goal Statement	*Generalizations*
	Adequate nutrition and weight control is essential during pregnancy and lactation.
- Sound nutrition knowledge is necessary to counteract the prevalence of faulty nutrition facts and practices.	"Health" foods are misnamed. There is no one food or food group best for health. Health is the result of many factors of which food is just one aspect.

Learning Experiences	*Resources*
• Determine the reasons for the differences in RDA requirements for nonpregnant, pregnant, and lactating women. Show kinds and amounts of foods that must be added to meet these needs. • Compare infant mortality in developing countries. Suggest means for affecting changes. • Relate complications of pregnancy such as eclampsia and toxemia to nutritional inadequacies. • Relate premature births to age of mother and her nutritional status.	Agencies United Nations, WHO Books *Cooper's Nutrition in Health and Disease* *Disadvantaged Children, Health, Nutrition* *Food and Man* *Food and Your Future* *Human Nutrition and Dietetics* *Introduction to Nutrition* *Nutrition and Diet Therapy* *Preschool Child Malnutrition, Primary Deterrent to Human Progress* Field Trips Prenatal clinic Pamphlets *Be Good to Your Baby Before It Is Born* *Lives in Peril* *Recommended Dietary Allowances* *Weight Control Source Book*
• Visit Health Food store. Study labels for content and compliance with FDA regulations. Compare cost to similar food purchased in supermarket.	Articles *Farmers Study Organic Market* *The Fertilizer Fight* *Health, Organic, and Natural Foods*

Goal Statement	*Generalizations*
	Advertising and media propaganda, based on unsound nutritional data, can result in poor dietary habits.

Learning Experiences	*Resources*
• Debate use of organically grown foods. Differentiate between "health," organic, and natural foods. • Evaluate 7th stage of Zen Macrobiotic diet for its nutritional adequacy in meeting RDA requirements for 19 year old male. • Write a "Sherlock Holmes" tale unraveling mystery of a food that is, or was, considered a fad such as graham crackers, fish, or tomatoes.	*Organic Food, How Much Nutrition, How Much Hoax?* *What About the "Organic" Way?* *Zen Macrobiotic Diets* Books *Consumer Economics* *The Consumer and His Dollars* *The Family Guide to Better Food and Better Health* *The Glorious Oyster* *Introduction to Nutrition* *The Nuts Among the Berries* *Pesticides and the Living Landscape* Field Trips Health Food store
• Read current periodicals for nutrition information. Refute or defend author's viewpoint. • Research TV advertising for children or adults. Evaluate nutritional information. • Compare or translate food advertisements in foreign magazines. Examine for nutritional facts. • Prepare commercial for TV or other media, advertising a food from the Basic Four.	Books *Consumer Economics* *The Family Guide to Better Food and Better Health* *Food and Your Future* *Introduction to Nutrition* *Let Them Eat Promises* *The Nuts Among The Berries* *Yearbook of Agriculture, Food for Us All*

Goal Statement	*Generalizations*
- Many factors affect what people eat.	Food use relates to the economic aspect of living. Supply and demand, and the level of income, help to determine what people eat.

Learning Experiences	*Resources*
	Posters *A Guide to Good Eating* *Daily Food Guide*
• Relate topography of areas in the United States and other countries to the food available. • Survey current periodicals for food industry's efforts and actions to control food prices. Interpret effect on eating habits. • Research food lobbies for state and national legislation. Project influence on food costs and availability. • Survey types of markets in low, middle, and high income areas. Compare foods available and prices. Correlate findings with percentage of income spent for food.	Agencies County Extension Service Books *The American Poor* *Dollars and Sense* *Farms and Farmers in an Urban Age* *Food and Civilization* *Food and Man* *The Great Nutrition Puzzle* *Healthful Living* *Human Nutrition, Historic and Scientific* *Hunger U.S.A.* *Hunger U.S.A. Revisited* *Introduction to Nutrition* *Let Them Eat Promises* *Red Flannel Hash and Shoofly Pie* *The Thumb on the Scale or the Supermarket Shell Game* *Yearbook of Agriculture, Power to Produce*

Goal Statement	*Generalizations*
	Social and cultural factors influence nutrition at all stages of development.

Learning Experiences	*Resources*
	Field Trips State House for legislative session and/or open hearing Supermarket Handbooks *Environmental Education, 7-12* Pamphlets *Hunger in America* *Hunger in Chicago* *Your Money's Worth in Foods, Home and Garden Bulletin No. 183*
• Interview older relatives or friends concerning cultural heritage with emphasis on food customs. Relate to own eating habits. • Research cultural taboos pertaining to food. Discuss their effects on eating habits and health. • Eat in foreign restaurant selecting balanced meal from menu. • Conduct international food fair. Integrate with art, music, literature, and other cultural aspects of each country. • Trace historical development of eating implements or cooking methods. Relate to kinds of food eaten.	Books *China, the Hungry Dragon* *Cooper's Nutrition in Health and Disease* *Eating and Cooking Around the World* *Food and Civilization* *Food and Life* *Food and Man* *Food Products and Their Source* *Introduction to Nutrition* *Nutrition and Diet Therapy* *Story of Foods*

Goal Statement	*Generalizations*
	Psychological needs are often fulfilled through food intake.

Learning Experiences	*Resources*
	Field Trips Foreign restaurants Plimoth Plantation Sturbridge Village **Films** *Food for a Modern World* **Pamphlets** *Lives in Peril* **Resource People** Representative from nationality club
• Review current periodicals for relationship of food intake to emotional needs. Identify with class eating habits. • Research interrelationship of infant feeding practices with emotional development. • Discuss psychological aspects of overweight and underweight.	**Articles** *Are You Overfeeding Your Child?* *How Nutrition Affects the Central Nervous System* *Nutrition and Learning* *Nutrition and Society* **Books** *Cooper's Nutrition in Health and Disease* *The Family Guide to Better Food and Better Health* *Introduction to Nutrition* *Nutrition for the Growing Years*

Goal Statement	*Generalizations*
• Food and nutrition play a vital role in the physical and psychological health of a society or nation.	Americans are not eating as they should. Although it is a major problem with the poor, it also affects the more affluent citizens. Governmental and private agencies are providing food and nutrition education to improve nutritional well-being of all citizens.

Learning Experiences	*Resources*
	Race Against Famine *The Science of Man* Field Trips Child care centers Pamphlets *Adolescent Obesity* *Hunger in America* *Hunger in Chicago* *Nutrition and the Intellectual Growth in Children* *Why Children Don't Eat and What to Do About It*
• Debate the validity of the need for many Americans, rich and poor, to improve eating habits. • Investigate government programs to promote nutritional status of citizens. Judge success of programs and suggest means for improving. • Research school food service program. Discuss regulations mandating types of food served. Explore reasons for low cost of Type A meal. Activate a student advisory lunch committee. Use the school food service program as a learning experience for business management courses. • Volunteer services for government programs such as assisting with elderly feeding or breakfast programs; delivering commodity foods; demonstrating use of commodity foods.	Agencies Massachusetts Department of Education Department of Public Health Office of Elderly Affairs Articles *Evaluations of USDA Food Programs* *Focus on Nutrition - You Can't Teach a Hungry Child* Books *Food and Man* *Hunger U.S.A.*

Goal Statement	*Generalizations*

Learning Experiences	*Resources*
• Investigate the food stamp program. Have a panel discussion on the advantages and disadvantages of the food stamp and commodity distribution programs; debate continued use of these programs versus a minimum income level in terms of improved nutritional well-being.	*Hunger U.S.A. Revisited* *If We Had Ham, We Could Have Ham and Eggs, If We Had Eggs* *Introduction to Nutrition* *Let Them Eat Promises* *Nutrition and Diet Therapy* *Poverty in an Affluent Society* *The School Lunch* *The School Lunchroom* *Their Daily Bread* *Yearbook of Agriculture, Food for Us All* Field Trips Commodity distribution center Elderly feeding programs Films *Agriculture and the New Deal* *Food from the Desert* Handbooks *Handbook for Volunteers, Child Nutrition Programs, FNS 10* Pamphlets *Lives in Peril* *Hunger in America*

Goal Statement	*Generalizations*
	In developing countries, poor nutrition is a major reason for slow progress. Governmental and private agencies are providing services to improve the nutritional status of these populations.

Learning Experiences	*Resources*
	Hunger in Chicago *National School Lunch Program Background and Development, FNS 63* *Ten-State Nutrition Survey* Resource People County Extension Service nutritionist Department of Education nutritionist Public Health nutritionist School food service supervisor
• Select a developing country. Report ways in which United States or world agencies are helping to improve the nutritional status. Project effects of improved farming methods, transportation, marketing, and storage on food supplies and economy. • Investigate Peace Corps activity in developing country. Correspond with worker to learn of living conditions and needs of the people. • Explore development of supplementary foods such as *Incaparina*, FPC (fish protein concentrate), and soy products. Include purpose, funding, and results. • Request samples of supplementary foods from producers. Taste-test samples. Suggest reasons for acceptance or rejection.	Agencies American Association of Cereal Chemists American Corn Millers Federation Corn Products Corporation Ford Foundation Kellogg Company Nabisco — Astra Pan American Health Organization Quaker Oats Company Ralston-Purina Company Rockefeller Foundation Swift Chemical Company United States Agency for International Development (AID)

Goal Statement	*Generalizations*

Learning Experiences	*Resources*
	Department of Agriculture
	Peace Corps
	Vista
	Volunteers for International Technical Assistance
	Worthington Foods
	Articles
	The New Foods, and the Markets That Need Them
	Pure Fish Protein
	Soy Protein: Food Services New Staple?
	Books
	Attack on Starvation
	Conservation
	Eating and Cooking Around the World
	The Farmer
	Feeding the World
	Food and Man
	Man's Impact on Nature
	The Pageant of South American History
	Race Against Famine
	The School Lunchroom
	The Strategy Toward the Conquest of Hunger

Goal Statement	*Generalizations*
- Wise consumer practices are needed to provide adequate food and nutritional health for all.	Nutritious foods need not be expensive. Shop in supermarkets, buy in-season foods, appraise ready-prepared foods.

Learning Experiences	*Resources*
	The Third Horseman, a Study of World Poverty and Hunger *World Food* Films *China: Feeding One-Fourth of the Human Race* *Economic Geography — Comparing Two Nations* *Food Crisis* *Food Revolution* *Food of Southeast Asia* *Rice* Pamphlets *India: A Partnership* *President's Review and Annual Report, 1970* *Protein Gap*
• Examine newspaper advertisements and compare weekly specials. Plan weekly menu and grocery list for three income levels — low, medium, and high. Survey unit-pricing of food items. • Relate package size to cost and family; convenience for a person living alone; family of four; family of eight. • Explore nutritive labeling of food. Survey family or friends to determine usage and value. • Compare cost, appearance, flavor, convenience of TV dinner to similar home-prepared meal.	Agencies Consumer and Marketing Service County Extension Service Food and Drug Administration Massachusetts Consumers Council Articles *Nutrition Labels Speeded by FDA* *Policy Statement of the American Dietetic Association on Nutrition Labeling*

Goal Statement	*Generalizations*
	Nutritional supplements and engineered foods are available to consumers.

Learning Experiences	*Resources*
• Invite extension nutritionist to explain expanded nutrition program, or plan visit to extension office or class.	Books *The Family Guide to Better Food and Better Health* *Food and Your Future* Pamphlets *Consumer Report* *Family Economics Review* *Plentiful Foods* *USDA Grades, To Help You Choose* Resource People County Extension Service nutritionist Food retailer
• Compare cost and nutrient values of several name brand vitamin and mineral supplements. • Research current books and periodicals for information on vitamin and mineral overdosage. • Compare cost and nutritive value of engineered foods such as whipped toppings, breakfast drinks, nondairy creamers. • Explore engineered foods being used for school breakfast. Evaluate cost, convenience, and acceptability.	Agencies Manufacturers of engineered foods Massachusetts Department of Education Articles *Warning on Vitamins: Massive Doses of Any Kind Unsafe* *Well Balanced Diet Needs No Supplements* Books *Cooper's Nutrition in Health and Disease* *The Family Guide to Better Food and Better Health*

Goal Statement	*Generalizations*
• The food industry is a major factor in the economy of this country and the world.	The food industry is the largest industry in the world. New foods are being developed to meet the world's growing population.

Learning Experiences	*Resources*
	Nutrition and Diet Therapy *The Nuts Among the Berries* Field Trips Arthur D. Little Company U.S. Army Research Laboratories, Natick Pamphlets *Eat to Live* *Vitamins, Minerals and Americans* Resource People County Extension Service nutritionist
• Trace development of grocery industry in United States. • Prepare lesson for lower grade showing changes in number of farms and crop yield in the United States during the past 75 years. Teach lesson. • Research the development of high-yielding varieties of grains. Evaluate their effect on world food problems. • Explore the growth of the food service industry. Eat in a variety of restaurants. Evaluate opportunity of selecting a balanced meal in each. • Investigate changes in food products available to consumer from World War II to present; to soldiers in World War II and in Vietnam; to astronauts in first space flight and in trip to moon. Taste-test army or space travel rations. Visit experimental laboratories in Natick.	Articles *High-Lysine Corn* *High Lysine Corn, What Lies Ahead?* *Tastier Types Sought for High Yield Rice* Books *Conservation* *The Farmer* *The Farmer's Frontier 1865-1900* *Farms and Farmers in Art* *Farms and Farmers in an Urban Age* *The First Comers*

Goal Statement	*Generalizations*

Learning Experiences	*Resources*
	Food and Life *Food Facts for Young People* *Food and Man* *The Forgotten Minority* *The Lifeline of America, Development of the Food* *Man's Impact on Nature* *The Matador Land and Cattle Company* *The Pageant of South American History* *Race Against Famine* *The Thirties — America and the Great Depression* *This Crowded Planet* *World Food* Field Trips Restaurants — variety of types U.S. Army Research Laboratories, Natick Films *Agriculture and the New Deal* *Food for a Modern World* *The Food Revolution* *Rice*

Goal Statement	*Generalizations*
	Countries import foods which are scarce and export foods which are abundant or in demand. Producing foods for export rather than home use may adversely affect nutritional status of the population.
• Regulations on the federal, state and local levels govern food production and processing.	Foods must be grown and transported in a safe manner. The use of pesticides should be controlled.

Learning Experiences	*Resources*
	Pamphlets *Lives in Peril* *Partnership to Improve Production in India* *President's Review and Annual Report*
• Survey imported foods in grocery store. Evaluate why domestic products cannot or do not take their place. • Taste-test imported food items with similar domestic products. Compare cost, flavor, and appearance. • Discuss impact of the Common Market on world trade and food supplies. • Debate the issue whether food supplies influence peace programs.	Agencies United Nations United States Department of Agriculture Department of Commerce Federal Trade Commission Food and Drug Administration Books *Consumer Economics* *Getting the Most for Your Money* *The Thirties — America and the Great Depression* Resource People Grocery store manager
• Invite county or state agricultural agent to speak on use of pesticides and fertilizers. • Investigate federal food regulations. Compare with those of other countries. • Interview dairymen to determine state and local regulations governing milk production.	Agencies American Dairy Association New England Dairy and Food Council United States Department of Agriculture

Goal Statement	*Generalizations*
	Processed foods must be free from any harmful substances.

Learning Experiences	*Resources*
- Assist as teacher's aide with a lower grade field trip to farm. Teach younger children about safe food production. - Write science fiction story describing what would happen to the world without use of pesticides. - Debate the use of chemical fertilizers versus organic farming.	Articles *The Fertilizer Fight* *Health, Organic and Natural Foods* *The Organic Food Kick* *The Organic Fraud* *Other Organic Thoughts* Books *The Family Guide to Better Food and Better Health* *Foods, Diet and Nutrition* *Introduction to Nutrition* *Pesticides and the Living Landscape* *Silent Spring* Pamphlets *Milk Information Sheet* Field Trips Local dairy farm Resource People State or County Agricultural Agent
- Interview FDA agent on the GRAS (generally recognized as safe) list. Use for school or local newspaper article. - Analyze a food or menu for both natural-occurring and added chemical elements.	Agencies Federal Trade Commission Food and Drug Administration

Goal Statement	*Generalizations*
	To assure a sufficient supply, food resources must be managed scientifically.

Learning Experiences	*Resources*
• Survey labels of processed foods for chemical additives. Determine function in product. • Investigate foods or chemicals labeled unsafe during past five years. Examine evidence for determination and effect of restriction on food industry. • Review unsanitary food processing and handling at the turn of the century. Compare with complaints being made by consumers today.	Articles *Breed* *Cyclamate Bill, A Sleeper Would Cost Taxpayers Money* *FDA Proposes Nutrient Labeling Rules* *Labels Could Tell All, If Bay State Legislators Agree* *Scientists Attack Fortified Cereals* Books *The Chemicals We Eat* *Consumer Economics* *Cooper's Nutrition in Health and Disease* *The Family Guide to Better Food and Better Health* *Famine in the Wind* *Food Facts for Young People* *Foods, Diet and Nutrition* *Fundamentals of Natural Nutrition* *The Hidden Assassins* *Poisons in Your Food*
• Investigate systems to maximize wise land use such as crop rotation, summer fallowing, irrigation. • Debate the issue of government programs for price support of food products.	Agencies Cooperative County Extension Service Food and Agriculture Organization (FAO)

Goal Statement	*Generalizations*

Learning Experiences	*Resources*
• Investigate "fish farming" as a means of increasing food supply. • Explore use of marine plant life as a source of food. • Evaluate kinds and amounts of surplus foods donated by the government for domestic or foreign use.	Massachusetts Department of Education Department of Public Health United States Department of Health, Education and Welfare Department of the Interior Books *Conservation* *Consumer Economics* *Dollars and Sense* *Farms and Farmers in an Urban Age* *Feeding the World* *Man's Impact on Nature* *World Food* *Yearbook of Agriculture:* *Food For Us All* *Power to Produce* Films *The Food Revolution* *Projection — 70*

Goal Statement	*Generalizations*
• A wise use of food resources is essential. Personal and political recourses are available to concerned citizens.	The food industry and the individual should minimize sources of pollution resulting from food usage. Some government controls have been formulated to protect the environment from pollution due to food usage.

Learning Experiences

- Visit local health and sanitation departments to learn laws governing waste disposal. Discuss ways of implementing and improving controls.
- Debate ecological aspects of convenience foods.
- Debate issue of government regulations from viewpoint of food industrialist versus environmentalist.
- Tour school cafeteria or other feeding facilities to observe methods of waste disposal. Review current periodicals for experimental ways of waste disposal such as edible dishes, paper recycling, disintegrating containers.

Resources

Agencies

National Sanitation Foundation

State and Local Departments of Public Health

State and Local Departments of Sanitation

Handbooks

Environmental Education

Books

Conservation

Consumer Economics

Man's Impact on Nature

World Food

Field Trips

School cafeteria

PART THREE
TEACHING AIDS AND RESOURCE MATERIAL

Part Three presents some teaching aids and resource material to supplement nutrition education in grades seven through twelve. There are many others that could be added or substituted for those listed.

Some books are to be tasted, others to be swallowed, and some to be chewed and digested.

Francis Bacon

Annotated Bibliography

BOOKS — TEACHER REFERENCE

Cooper's Nutrition in Health and Disease. H.S. Mitchell et al. J.B. Lippincott Co., Philadelphia, 1968.

College text for nutrition, diet therapy, and health-related fields. Contains information on nutrients; digestion and absorption; social, psychological, and regional food patterns; and a comprehensive discussion of diet in disease. 685 pp.

Disadvantaged Children, Health, Nutrition and School Failure. H. G. Birch and J. D. Gussow. Harcourt, Brace and World, Inc., New York, 1970.

Thorough study of the effect of poverty on the intellectual potential of children. 322 pp.

Economics. P.A. Samuelson. McGraw-Hill Book Co., New York, 1967.

Introductory but technical college text in economics by a Nobel Prize winner. 821 pp.

Foods. M.M. Justin et al. Houghton-Mifflin Co., Boston, 1973.

Comprehensive book on nutritional content, preparation, purchasing, and preservation of foods. Suggested learning experiences geared to home economics, but book provides important basic information. 645 pp.

Fundamentals of Normal Nutrition. C.H. Robinson. The Macmillan Co., New York, 1968.

College text for programs in elementary education, dental hygiene, physical education, and home economics. Contains information on nutrients; food selection for nutritional, psychological, and cultural values; in-service nutrition education and international problems; and programs in nutrition. 669 pp.

Human Nutrition and Dietetics. S. Davidson and R. Passmore. Williams and Wilkins Co., Baltimore, 1967.

College text including information on foods, food function, deficiency diseases and disorders, dietary treatment of disease, and public health programs. 864 pp.

Introduction to Nutrition. H. Fleck. The Macmillan Co., New York, 1971.

College text including elements of nutrition and factors influencing individual nutritional status. Good supplementary material on food facts and fallacies, snacks, and diet modifications. 503 pp.

Introductory Nutrition. H.A. Guthrie. The C.V. Mosby Co., St. Louis, Missouri, 1971.

Comprehensive introductory nutrition text discussing nutrients, food needs throughout life, food faddism, and international nutrition concerns. A programmed instruction book accompanies the text. 511 pp.

Living Nutrition. F.J. Stare and M. McWilliams. John Wiley and Sons, Inc., New York, 1973.

College text with the main emphasis on the socio-psychological aspects of nutrition. Brief physiological nutrition section also included. 467 pp.

Malnutrition, Learning, and Behavior. Edited by N.S. Scrimshaw and J.E. Gordon. The MIT Press, Cambridge, 1968.

A collection of articles grouped according to topic. Good reference for advanced course work in the inter-relationship of malnutrition, learning, and behavior. 566 pp.

Nutrition. M.S. Chaney and M.L. Ross. Houghton-Mifflin Co., Boston, 1971.

Technical college text in nutrition with pertinent information on body needs as well as nutritional problems and concerns of today. 486 pp.

Nutrition and Physical Fitness. L.J. Bogert et al. W.B. Saunders Co., Philadelphia, 1973.

Classic college text. Contains basic nutrition information. 598 pp.

Nutrition Education in Action — A Guide for Teachers. E.A. Martin. Holt, Rinehart, and Winston, Inc., New York, 1963.

A teacher's guide to be used with *Nutrition in Action.* Excellent in-service training aid. 135 pp.

Nutrition for the Growing Years. M. McWilliams. John Wiley and Sons, Inc., New York, 1967. First corrected printing, September, 1968.

College text for child nutrition. Valuable to nutritionists, physicians, educators, public health workers, and parents. Covers nutritional needs of unborn child through adolescence; weight control; the sick child; questions mothers ask; and recipes of food favorites. 303 pp.

Nutrition in Action. E.A. Martin. Holt, Rinehart, and Winston, Inc., New York, 1971.

Good introductory college text for students with limited scientific background. 406 pp.

Practical Nutrition. A.B. Peyton. J.B. Lippincott Co., Philadelphia, 1962.

Good basic nutrition text or resource book. Includes nutrients; digestion; diet variations during pregnancy, infancy, childhood, and elderly; food fads; diet therapy; and consumer economics. Available in paperback. 434 pp.

BOOKS — STUDENT REFERENCE

Agriculture U.S.A. America's Most Basic Industry. H.B. Lent. E.P. Dutton and Co., New York, 1968.
Overview of modern American agriculture covering farming methods; crop and livestock production; food processing and marketing; current problems and future trends; career opportunities; and curriculum units on food, clothing, and farming. 160 pp.

American Poor, The. R.A. Liston. Delacorte Press, New York, 1970.
Good social science resource or subject book. Depicts social problems as well as extent of hunger. Explains efforts of governmental feeding programs. 191 pp.

Americans Before Columbus. E.C. Baity. Viking Press, New York, 1967.
Describes forms of agriculture, food, and corn cultures of the North and South American Indians. 224 pp.

Attack on Starvation. N.W. Derosier. The Avi Publishing Co., Inc., Westport, 1961.
Comprehensive text on individual and world food needs; development of agriculture; need for more food and better marketing and storage; threat of world starvation and how it may be controlled. 312 pp.

Biological Science — An Inquiry into Life. D.E. Meyer and R. Buchanan. Harcourt, Brace and World, Inc., New York, 1968.
Biology text concentrating mainly on microorganisms in relation to man instead of discussing man himself. Provides a microscopic view of life and its interdependence. 840 pp.

Biology and Human Progress. L. Eisman and C. Tanzer. Prentice-Hall, Inc., Englewood Cliffs, 1972.
Book geared to student who is difficult to motivate but also is a resource for the more practical aspects of applied sciences. Foods and nutrition unit provides basic information for junior high school student. Contains impressive photographs and diagrams. 530 pp.

Blue Trout and Black Truffles. J. Wechsberg. Alfred A. Knopf, New York, 1953.
Describes restaurant and dining elegance of the Hapsburg era. Focuses also on French customs. 288 pp.

Born to Starve. J. Tydings. Wm. Morrow and Co., New York, 1970.
Detailed explanation of factors contributing to and aggravating hunger and poverty throughout the world. 159 pp.

Canned Foods in Human Nutrition. National Canners Association, Washington, 1950.
Good resource for historical approach to canning as a method of nutrient preservation. 264 pp.

Chemicals We Eat, The. M.A. Benarde. American Heritage Press, New York, 1971.
Detailed explanation of chemicals as food components and additives. Includes discussion of foods of the future, pesticides, and fertilizers. 208 pp.

China, The Hungry Dragon. J. Scott. Parents Magazine Press, New York, 1967.
Good supplementary reading describing agricultural advancements and food shortages in China today. 256 pp.

Common Sense about a Starving World. R. Calder. The Macmillan Co., New York, 1962.
Approach to world starvation considering man's continual struggle for food with the time limit with which he also must contend. 176 pp.

Conservation. J. Jaffe. Natural History Press, New York, 1970.
Covers the extent of world food problems. Describes types of agriculture and developmental research as possible solutions. Well illustrated. 188 pp.

Consumer and His Dollars, The. D. Schoenfield and A.A. Natella. Oceana Publishers, Inc., Dobbs Ferry, 1966.
Well illustrated reference for information on frauds, quackery, and advertising "gimmicks." 365 pp.

Consumer Economics. F.F. Wilhelms et al. McGraw-Hill Book Co., New York, 1966.
Excellent reference for all phases of consumer economics. Includes American economy, good buying principles, labeling as a buying guide, and government aids for consumers. 495 pp.

Consumers All. United States Department of Agriculture, 1965.
Pertinent sections on kitchen equipment, basic nutrition, food purchasing, storage, and preparation. 496 pp.

Contours of Change. United States Department of Agriculture, 1970.
Includes technological development of agriculture, growing importance of United States in world agriculture, possibilities of future research and development, and problems of rural regions because of changes. 366 pp.

Cookbook of the United Nations, The. B. Kraus. Simon and Schuster, New York, 1970.
350 recipes from 125 member countries of the United Nations. Also includes brief description of each country. 128 pp.

Developing Child, The. H.E. Brisbane and A. Riker. Charles A. Bennett Co., Peoria, 1971.
Covers physical, emotional-social, and intellectual development. Includes case studies, guides, and thought questions to stimulate learning. Free teacher's guide. 480 pp.

Dollars and Sense. E. Gale. Fleet Pub. Corp., New York, 1965.
Very good discussion of wise food buying. Includes sample chart of comparative food shopping and budgeting tips for perishable and staple items. 283 pp.

Eating and Cooking Around the World, Fingers Before Forks. E. Berry. The John Day Co., New York, 1963.
Short readings with many pictures and facts on food and eating customs of some world populations such as India, Latin America, Africa. 96 pp.

Ecology of Malnutrition in the Far and Near East, The. J.M. May. Harner Pub. Co., Inc., New York, 1961.
Describes food resources, habits, and deficiencies in Eastern countries of the world. Good graphs, tables, and maps. 688 pp.

Everyday Life on the American Frontier. L.B. Wright. G.P. Putnam's Sons, New York, 1968.
Period prints and photographs of life from Virginia westward. 256 pp.

Family Guide to Better Food and Better Health, The. R.M. Deutsch. Meredith Corp., Des Moines, 1971.
Practical approach to food and nutrition. Includes nutrients, current controversies, sanitation, future needs and developments, food composition tables, and lists of recommended and not recommended books. 277 pp.

Famine on the Wind. G.L. Carefoot and E.R. Spratt. Rand McNally and Co., Chicago, 1967.
Different approach to world food shortage and population growth. Relates past history of disastrous plant diseases to present battle against parasitic plant disease. 231 pp.

Farmer, The. W. McMillan. Potomac Books, Inc., Washington, 1966.
Concise survey of American farming — its contributions to relief of hunger and to promotion of world economic growth. 120 pp.

Farmers' Frontier 1865-1900, The. G.C. Fite. Holt, Rinehart and Winston, New York, 1966.
Excellent history of agriculture in the United States. Period photographs. Extensive bibliography for books on farming history. 271 pp.

Farms and Farmers in Art. H. Harkonen. Learner Pub. Co., Minnesota, 1965.
Collection of paintings depicting agricultural scenes. Each painting described according to period, content, and artist. 64 pp.

Farms and Farmers in an Urban Age. E. Higbee. The Twentieth Century Fund, New York, 1963.
Description of farming in automated society, and political and sociological factors changing farm life in the past fifty years. 183 pp.

Feeding the World. A. Eisenberg. Abelard-Schuman, New York, 1965.
Biography of David Lubin, Food and Agriculture Organization (FAO), United Nations. 191 pp.

First Comers, The. A.L. Mariott. Longmans Green and Co., New York, 1960.
Includes food and agriculture of the first Indians. 246 pp.

Food. United States Department of Agriculture, 1959.
Comprehensive volume on importance of food and nutrition written by experts in the field. Good glossary. 736 pp.

Food, America's Biggest Business. P. Arnold and P. White. Holiday House, Inc., New York, 1959.
Detailed description of growing, processing, and selling of foods. Sections on packaging, research, and development. 338 pp.

Food and Civilization — A Symposium. S.M. Farber et al. Charles C. Thomas, Springfield, 1966.
Compilation of articles on how food has influenced development of mankind. Includes future of food, its sociological importance, and other factors influencing food consumption. 341 pp.

Food and Life. G. Ames and R. Wyler. Creative Educational Society, Inc., Mankato, 1966.
Excellent source book. Includes basic nutrition facts, food cultivation and cultures, conservation and pollution, animal and plant research, new sources of food. 144 pp.

Food and Life. United States Department of Agriculture, 1939.
One of the first comprehensive volumes on food. Good historical reference. 1169 pp.

Food and Man. M.E. Lowenberg et al. John Wiley and Sons, Inc., New York, 1968.
Excellent history of food in relation to man. Includes dietary diseases with discovery of cures, foods in relation to cultural, ethnic, and religious background, history of federal and United Nations nutritional programs. 339 pp.

Food and Your Future. R.B. White. Prentice-Hall, Inc., Englewood Cliffs, 1972.
Practical approach to nutrition covering many current issues as well as basic information. Appealing style. 470 pp.

Food Becomes You. R.M. Leverton. Iowa State University Press, Ames, 1965.
Practical nutrition information for lay and professional people in a very readable format. Available in paperback. 208 pp.

Foodbook, The. J. Trager. Avon Books (The Hearst Corp.), New York, 1970.
Excellent account of the foods and eating habits of people throughout man's development. Includes an extensive bibliography. 578 pp.

Food Facts for Young People. P. Arnold and P. White. Holiday House, New York, 1968.
Helpful information about eating habits and food values related to today's teenagers. Includes reducing diets, food-borne diseases, population explosion and food supplies, and sources of food for the future. 256 pp.

Food for People. S.R. Riedman. Abelard-Schuman, New York, 1961.
Investigates nutrition through historical review of food's effect on human body. Surveys present world food problem and suggests new food sources. 190 pp.

Food for Us All. United States Department of Agriculture, 1969.
Describes economics of food from farm to supermarket, buying and cooking foods, and nutrition with emphasis on basic food needs and creating good food habits. Historical development of governmental feeding programs. 360 pp.

Food for You. M. McWilliams and L. Davis. Ginn and Co., Lexington, 1971.
Textbook discussing relationship of diet to height, weight, complexion, energy levels, nerves, and state of mind. Includes eating patterns and Basic Four. 179 pp.

Food Products — Their Source, Chemistry and Use. E. Bailey. P. Blakiston's Son and Co., Philadelphia, 1921.
Interesting historical reference on food and food products in World War I economy. Many historical scientific references of food processing and manufacturing. 551 pp.

Foods, Diet and Nutrition. K.L. Jones et al. Caulfield Press, San Francisco, 1970.
Concise reference on basic food, diet, and nutrition information. Includes charts, graphs, glossary, and additional readings. 128 pp.

Foods in Homemaking. M. Cronan and J. Atwood. Chas. A. Bennett Co., Inc., Peoria, 1965.
Basic text for home economics classes. Good background for food selection and meal planning. Teachers guide available. 558 pp.

Forgotten Minority, The. R. Holland. The Macmillan Co., New York, 1970.
Story of the struggle of America's tenant farmers and migrant workers from 1800 to present. 153 pp.

French Revolution, The. D. Johnson. G.P. Putnam's Sons, New York, 1970.
Explains how food crisis was a contributing factor to Revolution. 128 pp.

Fresh, Canned and Frozen Food from Past to Future. W. Wise. Parents Magazine Press, New York, 1971.
Historical development of food production and marketing from primitive man through modern times. Good illustrations. 64 pp.

Fruitcake and Arsenic. J. Hemphill. Little, Brown and Co., Boston, 1962.
Simple, readable description of the growth of the Food and Drug Administration. 144 pp.

Fruits We Eat. C.L. Fenton and H. Kitchen. John Day Co., New York, 1961.
Explanation of plant structure and the origin, history, and growing places of fruit. 128 pp.

Getting the Most for Your Money. A. Scaduto. David McKay Co., Inc., New York, 1970.
Basic information on wise consumer practices. Excellent listing of local and national agencies useful for consumer advice. 241 pp.

Glorious Oyster, The. H. Bolitho. Horizon Press, Inc., New York, 1961.
Describes what oysters have represented from Roman times to periods in British history. Includes research on life of oyster, traditions, paintings, poems, and recipes. 174 pp.

Good Life for More People. United States Department of Agriculture, 1971.
Focuses on meeting the needs of the growing population of the United States, especially on the future utilization of natural resources. 391 pp.

Great Nutrition Puzzle, The. D.L. Callahan and A.S. Payne. Charles Scribner's Sons, New York, 1956.
Historical development of the science of nutrition in a readable format. 180 pp.

Harvest of the Sea. J. Bardach. Harper and Row, Pub., New York, 1970.
Discusses food wealth from the sea. Describes aquaculture, fish processing, and breeding. 301 pp.

Harvesters, The Story of Migrant People, The. L.R. Shotwell. Doubleday and Co., Inc., Garden City, 1961.
Tells who migrants are, where they come from, where they go, and what their future is. 242 pp.

Health — A Quality of Life. J.S. Sinacore. The Macmillan Co., New York, 1968.
Basic health text. Survey chapter on food and its nutrients. 496 pp.

Healthful Living — A Textbook of Personal and Community Health. H.S. Diehl and W. Dalrymple. McGraw-Hill Book Co., New York, 1968.
Comprehensive survey of community health problems and how the government and schools deal with them. 611 pp.

Hidden Assassins, The. B. Mooney. Follett Pub. Co., Chicago, 1966.
Discussion of need for consumer awareness to insure a safe food supply. Presents negative approach to use of food additives. 230 pp.

History of Agriculture in Southern U.S. to 1860, Volumes I and II. L.C. Gray. Peter Smith, Gloucester, 1958.
Excellent resource for a unit on the South particularly for the period leading to the Civil War. 1086 pp.

Home Life in Colonial Days. A.M. Earle. The Macmillan Co., New York, 1957.
Good resource book for food and eating customs. Cites specific activities and meanings of certain foods. 470 pp.

How Do They Make It. G. Sullivan. The Westminster Press, Philadelphia, 1965.
Good resource for short reports in science and social science on how certain food items have been produced and used. Includes salt, frozen foods, carbonated beverages, vinegar, butter, shredded wheat, dehydrated foods, beet sugar, bread, and yogurt. 140 pp.

How Will We Feed the Hungry Billions? J. Messner. Simon and Schuster, Inc., New York, 1971.
Poignant examination of war against hunger describing the reality of feeding the hungry billions. 189 pp.

Human Body, The. P. Lewis and D. Rubinstein. Grosset-Dunlap, New York, 1971.
A modern, scientific, and easy to read book about the human body. Excellent account of digestion and metabolism. 157 pp.

Human Nutrition — Historic and Scientific. Edited by I. Galdston. International Universities Press, Inc., New York, 1960.
Collection of articles describing food patterns in other countries and areas. Scientific milestones and men in nutrition and the importance to maintain a healthy body and world. 321 pp.

Hunger Fighters. P. DeKruif. Harcourt, Brace and Co., New York, 1928.
Collection of biographies about people researching and developing agriculture and nutrition. 377 pp.

Hunger U.S.A. New Community Press, Washington, 1968.
Report of the Citizen's Board of Inquiry into hunger and malnutrition in the United States. 96 pp.

Hunger U.S.A. Revisited. Southern Regional Council, Inc., 1972.
Progress report of Citizen's Board of Inquiry into hunger and malnutrition since 1968. 52 pp.

If We Had Ham, We Could Have Ham and Eggs. . . . If We Had Eggs. The Food Research and Action Center. Gazette Press, Inc., Yonkers, 1972.
Excellent discussion of a study of the National School Breakfast Program. 145 pp.

Indian America — The Black Hawk War. M. Gurkco. Thomas Y. Cromwell Co., New York, 1970.
Includes agriculture and farming of western Indian tribes. 223 pp.

Let Them Eat Promises — The Politics of Human Hunger. N. Kotz. Prentice-Hall, Inc., Englewood Cliffs, 1969.
Relates political history of human hunger in the United States. 272 pp.

Life in Anglo-Saxon England. R.I. Page. G.P. Putnam's Sons, New York, 1970.
Covers foods, feasts, and famines of early England. 179 pp.

Life in Colonial America. E.G. Speare. Random House, Inc., New York, 1963.
Covers farming and customs of early settlements in Virginia, Massachusetts, and Dutch colonies. 171 pp.

Life in Elizabethan England. A.H. Dodd. G.P. Putnam's Sons, New York, 1961.
Refers to food patterns of the wealthy during Elizabethan period of English history. 174 pp.

Life in Ireland. L.M. Cullen. G.P. Putnam's Sons, New York, 1968.
Includes periodic changes in dietary pattern during development of Irish civilization. 178 pp.

Life in the Middle Ages. J. Williams. Random House, New York, 1966.
Describes foods and farming methods of the Middle Ages. 160 pp.

Life in Norman England. O.G. Tomkeieff. G.P. Putnam's Sons, New York, 1966.
Traces dietary pattern and customs through course of Norman England. 178 pp.

Life in Regency England. R.J. White. G.P. Putnam's Sons, New York, 1963.
Brief mention of food customs in Regency England. 176 pp.

Life in Roman Britain. A.R. Birley. G.P. Putnam's Sons, New York, 1964.
Brief mention of dietary habits in Roman Britain. 176 pp.

Life in Victorian England. W.J. Reader. G.P. Putnam's Sons, New York, 1964.
Compares dietary habits of the poor, the wealthy, and the emerging middle class. 176 pp.

Life of the Marsh, The. W.A. Niering. McGraw-Hill Book Co., New York, 1966.
Illustrated book tying in the food chain with life in the marshlands. 232 pp.

Lifeline of America — Development of the Food Industry, The. E.C. Hampe, Jr., and M. Wittenberg. McGraw-Hill Book Co., New York, 1964.
Good resource for the history of agriculture and food processing in the United States. 390 pp.

Man's Impact on Nature. J.A. Lauwerys. Doubleday and Co., Inc., New York, 1969.
Well illustrated version of man's integral part in the complexities of nature. Deals with overpopulation and shortage in world food production. 188 pp.

Matador Land and Cattle Company, The. W.M. Pearce. University of Oklahoma Press, Norman, 1964.
History of a cattle-raising company from 1880 to 1951. Focuses on the range cattle industry and the characters involved in its development. 244 pp.

Miracle of Vitamins, The. D. Faber. G.P. Putnam's Sons, New York, 1964.
Biographical and historical data behind the discovery of vitamins. 158 pp.

Modern Biology. J.H. Otto and A. Towle. Holt, Rinehart and Winston, Inc., New York, 1969.
Comprehensive text covering cell development to human development. Section on environment and biogeography. Excellent description of elementary nutrition and digestion. 787 pp.

Money Management for Your Family. Better Homes and Garden. Meredith Pub. Co., Des Moines, 1962.
Basic reference for all phases of money management with brief discussion of food budgeting. 208 pp.

Monstrous Depravity. J. Gould. Wm. Morrow and Co., New York, 1963.
Fun reading of American cuisine with special barbs aimed at convenience foods. 224 pp.

Nobody Ever Tells You Those Things. H. McCully. Holt, Rinehart and Winston, New York, 1967.
Excellent presentation for a gourmet class on specific terms and preparations. Includes recipes. 308 pp.

Nutrition and Diet — Modifications for the Nurse. C. Townsend. Delmar Pub., Albany, 1966.
Good basic text and workbook on nutrition and diet therapy. Includes learning activities, charts, and diagrams. 202 pp.

Nutrition and Diet Therapy. S.R. Williams. C.V. Mosby Co., St. Louis, 1969.
Comprehensive text on basic nutrition applied to functions of human body. Includes diet therapy, food management, basic meal planning, and community health needs. 686 pp.

Nutrition Science and You. O. Mickelsen. Mc-Graw-Hill Book Co., New York, 1964.
Interesting presentation of the nutrients and the growth and development of the body. 127 pp.

Nuts Among the Berries, The. R. Deutsch. Ballantine Books, New York, 1968.
Delightful commentary of food quacks and quackery. Points out many advertising "gimmicks" to delude the unwary consumer. 320 pp.

Oranges. J. McPhee. Farrar, Straus and Giroux, New York, 1967.
Historical study of oranges. Includes processing and canning of orange juice. 149 pp.

Our Overcrowded World. T. Fisher. Parents Magazine Press, New York, 1969.
Good background book on population crises. Includes world's food problems. 256 pp.

Overseer — Plantation Management in the Old South, The. W.K. Scarborough. Louisiana State University Press, Baton Rouge, 1966.
Supplemental reading for a history unit on the United States. 256 pp.

Overweight Society, The. P. Wyden. Wm. Morrow and Co., New York, 1965.
History of fad diets and weight reducing schemes. Interesting exposé on cholesterol and diet foods. 338 pp.

Pageant of South American History, The. A.M. Peck. David McKay Co., Inc., New York, 1967.
Includes food and agriculture of South America with emphasis on fruits and maize. 246 pp.

People, Food, and Science. P. Cote. Ginn and Co., Lexington, 1972.
Excellent text for students who have had a beginning foods course. Includes sections on significance of food, nature of food, and management of food resources. 525 pp.

Pesticides and the Living Landscape. R.L. Rudd. University of Wisconsin Press, Madison, 1964.
Comprehensive reply to questions on effect of pesticides on plant and animal life. 320 pp.

Picture Book of the Continental Soldier. C.K. Wilbur. Stackpole Books, Harrisburg, 1969.
Pictorial presentation of the life of a Continental soldier, including cooking and eating utensils as well as rations. 96 pp.

Poisons in Your Food. R. Winter. Crown Pub., Inc., New York, 1969.
Cites need for safe food supply and what consumer can do to insure hygienically safe food. 248 pp.

Population and Survival. J.L. Nelson. Prentice-Hall, Inc., Englewood Cliffs, 1972.
Good supplementary reading for discussion of overpopulation. 119 pp.

Poverty in an Affluent Society. D.A. Durfee. Prentice-Hall, Inc., Englewood Cliffs, 1970.
Collection of writings on existence, causes, and effects of poverty, with recommendations to alleviate the problem. 114 pp.

Power to Produce. United States Department of Agriculture, 1960.
Good background material in changes in technology affecting our way of life. Includes tools and machinery, food production and processing, and a forecast of changes in the future. 480 pp.

Preschool Child Nutrition. National Academy of Sciences - National Research Council, Washington, 1966.
Compilation of studies in relation to malnutrition and the preschool child. 355 pp.

Protecting Our Food. United States Department of Agriculture, 1966.
Comprehensive book covering protection of food from growth, through processing and packaging, to the consumer. 386 pp.

Protectors, The. H. E. Neal. Julian Messner Inc., New York, 1968.
In-depth account of the development of the Food and Drug Administration. 190 pp.

Race Against Famine. M.A. Benarde. Macrae Smith Co., Philadelphia, 1968.
Presents world food problems in relation to population explosion. 97 pp.

Red-Flannel Hash and Shoofly Pie. L. Perl. The World Pub. Co., New York, 1965.
Describes how American historical periods and events helped to develop characteristic cuisines. Includes influence of Indians and recipes. 288 pp.

Rice. E. Young. Franklin Watts, Inc., New York, 1971.
Describes where and how rice is grown; relates new strains of rice to health, medicine, and research. 65 pp.

Sanitary Techniques in Food Service. K. Longrée and G. G. Blaker. John Wiley and Sons, Inc., New York, 1971.
Precise description of all sanitary procedures involved in food preparation. Provides many definitions, charts, and other illustrations. 225 pp.

Science of Man, The. A. Montague. Odyssey Press, Inc., New York, 1964.
Categorizes man according to his occupation. Brief reference to food and its relation to man's culture from an anthropological viewpoint. 158 pp.

School Lunch, The. M. Cronan. Chas. A. Bennett Co., Inc., Peoria, 1962.
Thorough account of the history, requirements and working mechanisms of the National School Lunch Program. 512 pp.

School Lunchroom, The. B. Bard. John Wiley and Sons, Inc., New York, 1968.
Informative account of school lunch program — history, success, and shortcomings. 190 pp.

Silent Spring. R. Carson. Houghton Mifflin Co., Boston, 1962.
Focuses on the effects of pesticides on wild life conservation. Discusses biological controls. 368 pp.

Soviet Union — The Fifty Years, The. H.E. Salisbury. Harcourt, Brace and World, Inc., New York, 1967.
Interesting discussion of food customs and how they evolved in modern Russia. 484 pp.

Story of Foods, The. F. Crissey. Rand McNally and Co., 1917.
Historical reference of food industry in relation to world economy to 1917. 543 pp.

Strategy Toward the Conquest of Hunger. J.G. Harrar. The Rockefeller Foundation, New York, 1967.
Collection of selected papers. Describes every aspect of work being done by the Foundation. 315 pp.

Teen-ager's Guide to Diet and Health, The. R. Goodhart. Prentice-Hall, Inc., Englewood Cliffs, 1965.
Comprehensive coverage of teen nutrition, simply illustrated for personal appeal. Includes units from chemistry to manners. 176 pp.

Their Daily Bread. Committee on School Lunch Participation. McNelley-Rudd Printing Service, Inc., Atlanta, 1968.
Excellent discussion of a study of the National School Lunch Program. 135 pp.

Third Horseman — A Study of World Poverty and Hunger, The. G. Bowe. Pflaum Press, Dayton, 1967.

Study inspired by Pope John XXIII's Populorum Progressio. 262 pp.

Thirties — America and the Great Depression, The. F.W. Boardman, Jr. Henry Z. Walde, Inc., New York, 1967.

Includes status of food and agriculture, advent of supermarkets and refrigeration, and farm and agricultural acts. 152 pp.

This Crowded Planet. M.O. Hyde. McGraw-Hill Book Co., Inc., New York, 1961.

Comprehensive discussion of world food problem. 159 pp.

Thumb on the Scale or the Supermarket Shell Game, The. A.Q. Mowbray. J.B. Lippincott Co., New York, 1967.

Story of the unsuccessful 5-year struggle to enact effective truth-in-packing legislation (Hart Bill). 200 pp.

To Feed a Nation. J. McCay. Thomas Nelson, Inc., New York, 1971.

History of farming, science, and agriculture in America and their role in the world of tomorrow. 190 pp.

Treasury of American Indian Herbs, A. V. Scully. Crown Publishers, Inc., New York, 1970.

Explains the lore of herbs used by American Indians and how these herbs were used for food, drugs, and medicine. 306 pp.

Understanding Food — The Chemistry of Nutrition. B. Tannenbaum and M. Stillman. McGraw-Hill Book Co., Inc., New York, 1961.

Introduction to chemical inter-relationship between food and the human body. 206 pp.

Vitamin C and the Common Cold. L. Pauling. W. H. Freeman and Co., San Francisco, 1970.

Conclusions of this chemist's research on the prevention of colds by using massive doses of vitamin C. 122 pp.

Vitamin Hunters, The. A. Von Haller. Chilton Co., New York, 1962.

Engrossing story of scientists who discovered cause and cure of nutritional diseases. 307 pp.

White House Conference on Food, Nutrition and Health. United States Government Printing Office, Washington, 1969.

Summary of panel and task force reports and recommendations. 341 pp.

World Food. E. Raskin. McGraw-Hill Book Co., New York, 1971.

Excellent reference on development of cereal grains through advanced agricultural techniques. Includes discussion on how improved nutritional sources affect the people who eat the food. 160 pp.

FILMS

Agriculture and the New Deal. Encyclopedia Britannica Educational Corp.

Excellent film pertaining to plight of agriculture and the farmer's fight for recognition. Black and white. 16 minutes.

Big Dinner Table, The. New England Dairy and Food Council

Relates the foods of children from other cultures to the four basic food groups. Color. 12 minutes.

China — Feeding One-Fourth of the Human Race. McGraw-Hill Text Films

Explores one of China's most pressing problems. Includes food-producing regions, staple foods grown and used, and the government's efforts to improve the food supply. Color and Black and White. 16 minutes.

Economic Geography — Comparing Two Nations. Bailey Film Associates

Excellent comparison and contrast of industrial and traditional countries. Color. 15 minutes.

Food Crisis. Indiana University

Excellent comparison of traditional and advanced agricultural and marketing methods. Black and White. 60 minutes (2 parts).

Food, Energy and You. New England Dairy and Food Council

Animated scenes showing plant storage of energy through photosynthesis and human mechanisms releasing and using energy from food. Color. 20 minutes.

Food for a Modern World. New England Dairy and Food Council

Depicts history and the agricultural differences throughout the world. Explains need for mass food production. Color. 21 minutes.

Food from the Desert. Ernest Kleinberg Films

Explains how deserts are converted from barren sand to fertile soil. Color. 12½ minutes.

Food — Meeting the Patient's Need. College of St. Teresa, Minnesota

Includes physiological, psychological, and sociological food needs of the patient. Designed for a nursing course but also excellent for a diet technician or diet aide course. Color. 20 minutes.

Food of Southeast Asia. Film Associates of California

Describes the main foods of this area and how they contribute to the economy. Color. 18 minutes.

Food Platform, The. Pyramid Films

Excellent and enthusiastic explanation of the role of diet in achieving good health. Color. 20 minutes.

Food Projection 70. American Educational Films

Presentation of the technological and scientific aspects of the Green Revolution. Includes computerized farms, hybrid animals, and new cereal strains. Color. 25 minutes.

Food Revolution, The. McGraw-Hill Text Films

Depicts world malnutrition and starvation with programs and projects being conducted to alleviate these conditions. Color. 25 minutes.

Globe Struggle for Food, The. McGraw-Hill Text Films

Narration of world food problems with some of the conditions and solutions. *India* oriented scenes. Black and White. 28 minutes.

House of Man — Part II (Our Crowded Environment). Encyclopedia Britannica Educational Corp.

Overall historical perspective of human and technological advancements since 1900. Includes overpopulation, food problems, and pollution. Color. 11 minutes.

How a Hamburger Turns Into You. New England Dairy and Food Council

Traces the metabolism of protein from digestion through resynthesis in cells. Provides an excellent illustration of DNA formation. Color. 20 minutes.

How the Body Uses Energy. McGraw-Hill Text Films

Good overview of getting energy directly through sun and indirectly through food. Points out specific locations and functions of the digestive system. Color. 15 minutes.

Human Body — Nutrition and Metabolism, The. Coronet Films

Good classification of nutrients according to function but some outdated sequences. Color. 14 minutes.

Journey into Nutrition. Indiana University

Illustrates that common nutrient needs are met differently by various countries, that overeating is just as bad as undereating, and that snacks should complement rather than replace meals. Color. 25 minutes.

Man and His Land. Massachusetts Petroleum Council

Cartoon presentation with folk songs. Traces search for food from hunting and gathering through Dark Ages; the discovery, revolution, and expansion of America; introduction of oil and industry to maintain equilibrium between supply and demand. Color. 28 minutes.

Man as Hunter and Food Gatherer. McGraw-Hill Text Films

Links primitive food hunting and gathering cultures of ancient man with those of similar tribes today. Color. 19 minutes.

Poisoned Planet, The. McGraw-Hill Text Films

Advocates a combination of biological and pesticide control to check agricultural pests. Color. 19 minutes.

Population Explosion. McGraw-Hill Text Films

Cartoon presentation of elements and factors of population explosion and control. Color. 15 minutes.

Real Talking, Singing, Action Movie About Nutrition, The. Sunkist Growers, Inc.

Good motivational film on nutrition for junior high school students. Color. 14 minutes.

Rice. McGraw-Hill Text Films

Interesting presentation of rice culture touching on world food shortages and the agricultural and living habits of people in rice-growing countries of the Far East. Black and White. 29 minutes.

To Feed the Hungry. McGraw-Hill Text Films

Film release of TV special on hunger and malnutrition in America. Color. Two parts. Total 45 minutes.

Tomorrow's World — Feeding the Billions. McGraw-Hill Text Films

Excellent presentation of the world food crisis including desert and fish farming, jungle farming, and population control. Color. 52 minutes.

FILMSTRIPS

Feeding Your Young Children. New England Dairy and Food Council

Practical guidelines for parents of preschool children for building good eating habits. Also available in 2" x 2" slides. Color.

How Food Becomes You. New England Dairy and Food Council

Supplements and highlights information in pamphlet, *How Your Body Uses Food.* Color.

Your Food — Chance or Choice? New England Dairy and Food Council

Examines teen-age food choices and how to apply principles of decision-making and nutrition to daily food practices. Includes teacher's guide. Color.

HANDBOOKS

Composition of Foods, Agricultural Handbook No. 8. United States Department of Agriculture, 1963.
Nutritive analysis of over 2,400 raw, processed, and prepared foods expressed in one pound and 100 gram portions. 190 pp.

Environmental Education 7-12. New York State Education Department, Environmental Task Force, 1972.
Instructional activities in environmental education prepared by nine northeastern states. 62 pp.

Food Values of Portions Commonly Used. C. Church and H. Church. J.B. Lippincott Co., Philadelphia, 1970.
Nutritive analysis of foods expressed in household portions commonly used and in one pound amounts. Special section on "non-nutritive" food additives describing uses and functions. 180 pp.

Handbook for Volunteers, Child Nutrition Programs FNS 10. United States Department of Agriculture, 1972.
Outlines government feeding programs and describes responsibility of volunteers. 16 pp.

Nutritive Value of Foods, Home and Garden Bulletin No. 72. United States Department of Agriculture, 1971.
Nutritive analysis of over 600 commonly used food items in household units. 41 pp.

KITS, ACTIVITY PIECES, AND MISCELLANEOUS

Animal Feeding Demonstrations for the Classroom. New England Dairy and Food Council
Directions for care and study of white rats in the classroom. Animals are supplied and taken back by the Council.

Comparison Cards. New England Dairy and Food Council
Set of fifty cards (11 x 8½"). Colorful bar graphs show major nutrient values contained in selected items.

Consumer Protection — Foods. United States Food and Drug Administration (FDA)
Reference sheets explaining history and responsibility of FDA. Includes pamphlets on pesticides, food additives, standards and labels.

Fluoridation Facts. Massachusetts Department of Public Health
Collection of articles, posters, buttons, and other material advocating fluoridation.

Food Makes the Difference. United States Department of Agriculture
Very good nutrition education kit on the Basic Four.

Food Models. New England Dairy and Food Council
172 photographic, life-size models, in color, and four-page teacher's guide. Food values and contribution to recommended daily allowance for girls, 14-16 years old, are printed on back of models.

Girl and Her Figure and You, A. New England Dairy and Food Council
Activity piece to accompany pamphlet, *A Girl and Her Figure.*

Vitamins and Your Health. Vitamin Information Bureau, Inc.
A program kit on vitamins and their importance.

PAMPHLETS

American Institute of Baking
Wonder of You, The. Detailed description of the nutrients — their metabolism and use. 12 pp.

Agency for International Development
Protein Gap. Describes extent of world malnutrition, why protein is needed, and efforts to combat this problem. 24 pp.

American Association for Health, Physical Education, and Recreation
Nutrition for Athletes. Handbook for coaches including nutritional guidelines, teen-age problems, food myths, suggestions for eating and athletic events, and dietary supplements. 56 pp.

American Diabetes Association
Fact Sheet on Diabetes. Essential facts about diabetes. Excellent resource for a teacher who may have a diabetic student. 4 pp.

Facts About Diabetes. Explains all aspects of diabetic life-style and describes current research. 28 pp.

American Dietetic Association
Understanding Food Patterns in the U.S.A. Compilation of food patterns of cultural and ethnic groups. 16 pp.

American Medical Association
Vitamin Supplements and Their Correct Use. Includes source and function, conditions for use, and defines therapeutic vitamins with warning against excessive vitamin intake. 6 pp.

Your Age and Your Diet. Briefly describes food and nutrient needs for various age groups. 5 pp.

Association for Childhood Education International
Nutrition and Intellectual Growth in Children. Synopses of articles and booklets discussing American and world nutrition and malnutrition. 63 pp.

Cereal Institute

Breakfast Source Book. Background information on the importance of an adequate breakfast. 32 pp.

Consumers Union

Consumer Reports. Monthly periodical evaluating a variety of products. Reader should be aware of some alarmist attitudes.

Chicago Sun-Times

Hunger in Chicago. Reprints of newspaper articles by Linda Rockey (April 13-21, 1969). 16 pp.

Florida Citrus

Beauty Habit or How to be a Doll, The. Excellent guide for teen-age girls in beauty care.

How to Get in Shape and Stay There. Information on proper diet and exercise. 7 pp.

Road to Beauty, The. Adolescent guide for food, sleep, exercise, and make-up. Some tips about diet during a career and motherhood. 8 pp.

General Foods

Protein and Breakfast — More Important than You May Think. Good explanation of importance of breakfast. Simplified explanation of digestion. 5 pp.

H. J. Heinz, Co.

Story of Food Preservation, The. Good historical information on the methods of food preservation. Includes a teacher's guide. 96 pp.

Kansas Wheat Commission

Eat to Live. Excellent over-all nutrition source book. 64 pp.

Kellogg Company

Great Controversy of 1970. Statements and testimony on breakfast cereals and nutrition. 6 pp.

Manufacturing Chemists Association, Inc.

Everyday Facts — Food Additives. Describes what they are, how they work, some samples of how they are used, their control, and effects. 5 pp.

Food Additives — What They Are and How They Are Used. Comprehensive treatment of additives including consumer protection, legislation, and the implications of feeding a growing population. 63 pp.

Massachusetts Department of Public Health

Selected Nutrition References. Listing of recommended and non-recommended nutrition books. 17 pp.

Why Children Act That Way About Food. Describes children's reactions to food at different ages. 7 pp.

Mead Johnson Company

Why Children Don't Eat and What to Do About It. Brief explanation of eating habits in children and ways to build good habits. 4 pp.

Miles Laboratory, Inc.

Vitamins, Minerals and Americans. Collection of seventy studies on nutritional status of people in the United States. 17 pp.

National Foundation — March of Dimes

Be Good to Your Baby Before It Is Born. Describes prenatal needs of the mother, father, and baby. 29 pp.

National Research Council

Recommended Dietary Allowances. Reference tables for nutritional needs of Americans based upon age, sex, and activity with explanations of need. 101 pp.

New England Dairy and Food Council

Boy and His Physique, A. Essential roles of nutrition and exercise in physical development of teen-age boy with emphasis on self-motivation. 36 pp.

Can We Eat Well for Less? Ways to save money while serving nutritious meals. 16 pp.

Food Before Six. Folder for parents to help children under six enjoy eating well. Can be used with filmstrip, *Feeding Your Young Children.* 8 pp.

Girl and Her Figure, A. Helps teen-age girls to understand role of nutrition in their physical development. 40 pp.

How Your Body Uses Food. Easy, safe experiments with food to motivate interest in the body's use of food for growth, energy, and health. 28 pp.

Let's Take Milk Apart. Student handbook with experiments to examine components of milk. 32 pp.

Milk Information Sheet. Fact sheets on seventeen kinds of milk. 4 pp.

Nutrition Source Book. Basic nutrition information for teacher or community leader. 41 pp.

Source Book on Food Practices, A. Reference for health professionals on factors influencing food habits. 20 pp.

Taking Milk Apart. Teacher's guide to accompany *Let's Take Milk Apart.* 48 pp.

Weight Control Source Book. Review of published information on obesity. 20 pp.

New York Times

Hunger in America. Collection of newspaper articles describing hunger in the United States (February 16-20, 1969). 12 pp.

Nutrition Foundation, Inc.

Food — A Key to Better Health. Covers Basic Four food groups, nutritional requirements for various age groups, weight control, and meal planning. 21 pp.

Food Choices: The Teen-age Girl. Psychological and sociological reasons for teen-age food habits and how they can be adapted to constitute a balanced diet. 11 pp.

Obesity. Convincing approach to controlling weight for young people. 15 pp.

Your Diet: Health Is in the Balance. Good guide for nutrients and Basic Four food groups. Discusses fat controversy and other essential components of a balanced diet. 22 pp.

Nutrition Today

Adolescent Obesity. Reprint of article on adolescent obesity. 8 pp.

Rockefeller Foundation

Partnership to Improve Food Production in India, A. Summary of efforts of the Rockefeller Foundation to cooperate with developing countries in improving food production. Excellent illustrations. 135 pp.

President's Review and Annual Report, 1970. Covers the Foundation's involvement in world conquest of hunger, overpopulation, environmental quality, and cultural and educational development. 230 pp.

Sunkist Growers, Inc.

Build a Better You with Fresh Citrus. Information on importance of fresh citrus fruit in balanced diet. 15 pp.

Golden Fruit, The. Story of Arizona and California citrus fruit industry. 8 pp.

Merry Citrus from Around the World. Explanations of various holidays with recipes. 12 pp.

Unipub, Inc.

Lives in Peril (Protein Advisory Group). Excellent reference on protein-calorie malnutrition. 52 pp.

United States Department of Agriculture

Chemical Additives in Food. Need for chemical additives in food production and the regulations governing their use. 12 pp.

Child Nutrition Programs. Brochure summarizing the five main services of the Child Nutrition Programs. 6 pp.

Conserving the Nutritive Values of Food. Discusses how handling and preparation of foods affect nutrient content and suggests ways for conserving nutrient content. 16 pp.

Consumer Product Information. Periodical index of selected federal publications of the purchase, use, and care of consumer products.

Eat a Good Breakfast to Start a Good Day. Defines a good breakfast and describes staying power of various breakfasts. 7 pp.

Family Economics Review. Quarterly publication including income levels and expenditures for necessities.

Food Facts and Fun. Comic book introduction to eating a balanced diet. Good aid for student to use when teaching lower grades in a MAX-ED program. 16 pp.

Foods Your Children Need. Discusses food and eating habits of children. 5 pp.

Keeping Food Safe to Eat. Discusses prevention of family illness from harmful food bacteria. 12 pp.

National School Lunch Program Background and Development, FNS 63. Summary of the school food service program including European and United States history, legislation, and nutritional and technological developments. 30 pp.

USDA Grades — To Help You Choose. Collection of "How to Buy" fact sheets, and other consumer education materials.

Your Money's Worth in Foods, Home and Garden Bulletin No. 183. Includes budgeting, sample menus, and how to shop. 25 pp.

United States Department of Health, Education, and Welfare.

Additives in Our Food. Explains the whole story behind additives. 5 pp.

Bacteria, The Littlest Cells. Describes what bacteria are, how they grow, and how they contribute to disease and infections. Includes research to control pathogens. 14 pp.

Food for Groups of Young Children Cared for During the Day. Discusses feeding and meeting nutritional needs of children. 58 pp.

Head Start Programs. Collection of booklets describing the various aspects of Project Head Start. Includes guidelines for training, nutrition education, and parent involvement.

Malnutrition and Learning. Describes past and present work being done to determine extent and effects of malnutrition in the United States. Illustrates influence of socio-economic factors in malnutrition. 11 pp.

Ten-State Nutrition Survey 1968-1970. Compilation of data from national nutritional survey of ten states. Highlight summary and five volumes.

United States Senate Select Committee on Nutrition and Human Needs

Half a Loaf: Food Assistance in Fiscal Year 1972. Reports upon failure to use appropriated funds for government feeding programs. 15 pp.

Virginia Polytechnic Institute

Food for Young Children. Covers nutrient requirements for preschool children and suggestions for parents in developing good eating habits. 9 pp.

Vitamin Information Bureau, Inc.

Vitamins and Your Health. Technical leaflet for adults explaining what vitamins are and why they are needed. 11 pp.

Vitamins in Your Growing Years. Information for parents on the importance of vitamins in promoting growth and maintaining health. 3 pp.

POSTERS

Daily Food Guide. United States Department of Agriculture

Illustrates the four basic food groups and minimum number of servings from each.

Follow the Food Guide Every Day. United States Department of Agriculture

Poster describing the four basic food groups.

Grain-Origin of Breakfast Cereals. Cereal Institute
Shows various types of cereal grains and the structure of grain kernels.

Guide to Good Eating, A. New England Dairy and Food Council
Illustrates the four basic food groups. Leaflets and miniatures also available.

Prenatal Nutrition. Vitamin Information Bureau, Inc.
Color wall chart depicting the role of essential nutrients in fetal development.

See How They Grow. New England Dairy and Food Council
Illustrates individual differences in growth rates and body build in young children. Leader's guide also available.

Type A for a Better Day. United States Department of Agriculture
Colorful illustration of the Type A components.

You Need These Foods Daily for Good Health. Florida Citrus Commission
Shows the four basic food groups.

Your Snacks: Chance or Choice? New England Dairy and Food Council
Illustrates nutritious snacks designed to appeal to teen-agers. Teacher's guide and miniatures also available.

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